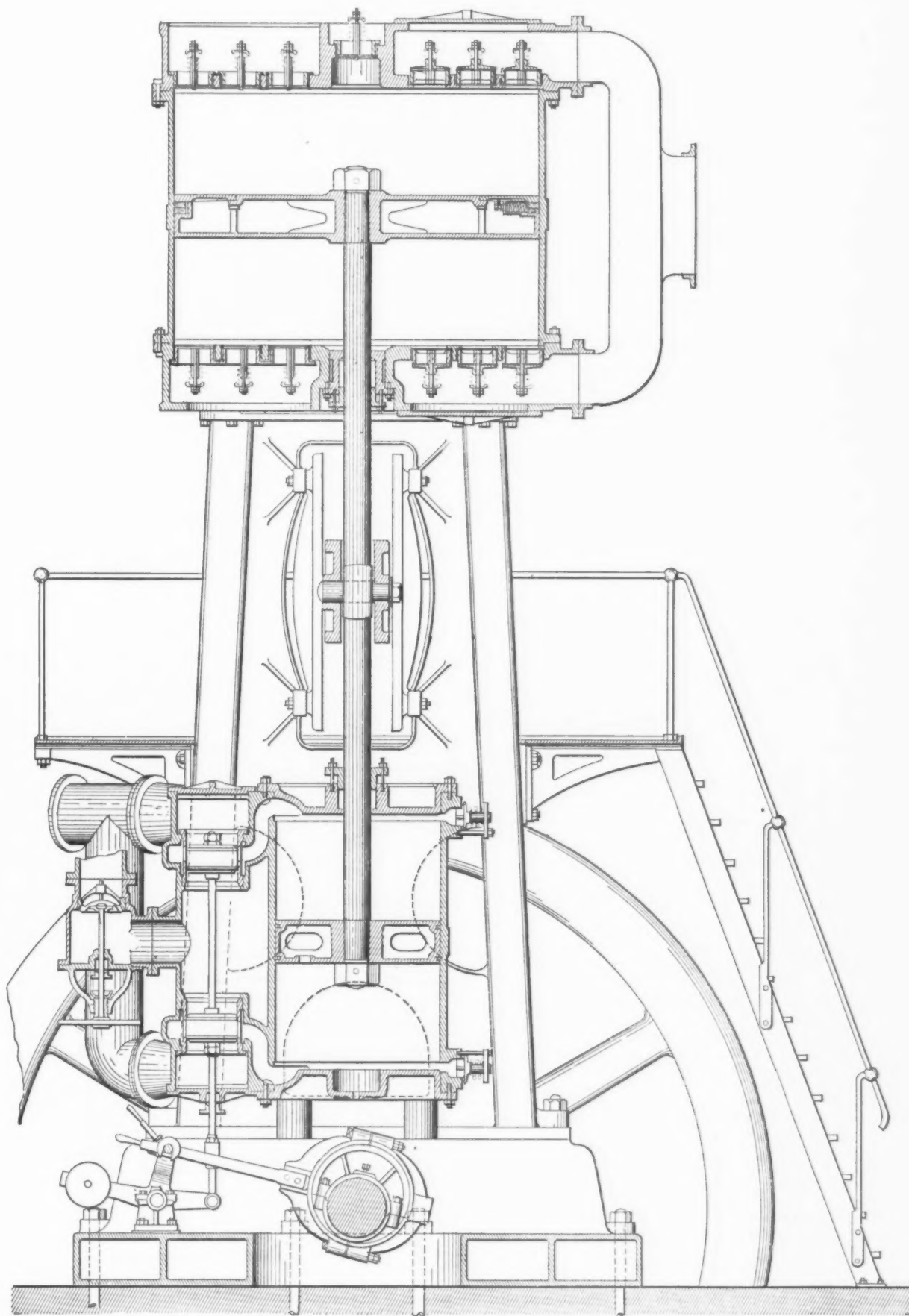


# THE IRON AGE

THURSDAY, JULY 25, 1889.



SECTIONAL ELEVATION OF BLOWING-ENGINE, BUILT BY WILLIAM TOD & CO.

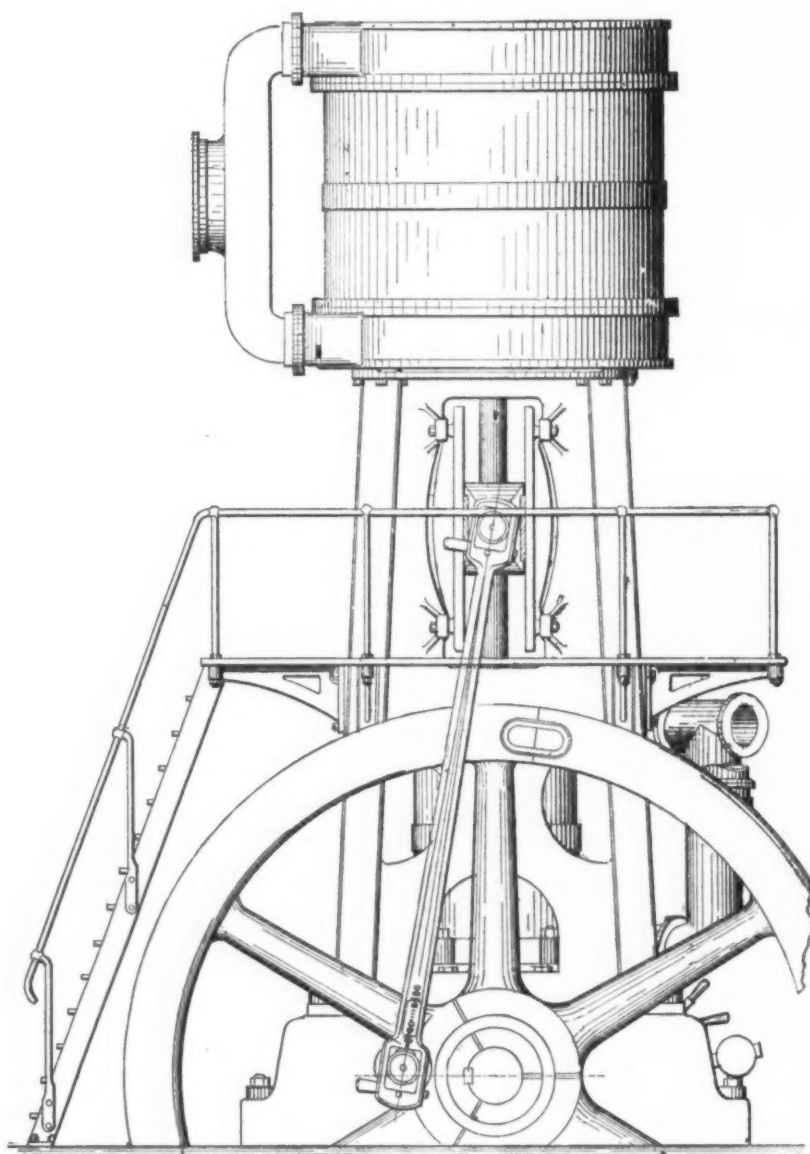
**Blowing-Engine.**

The accompanying drawings show the most essential features of a blowing-engine of new design built by William Tod & Co., of Youngstown, Ohio, for the Shenan-

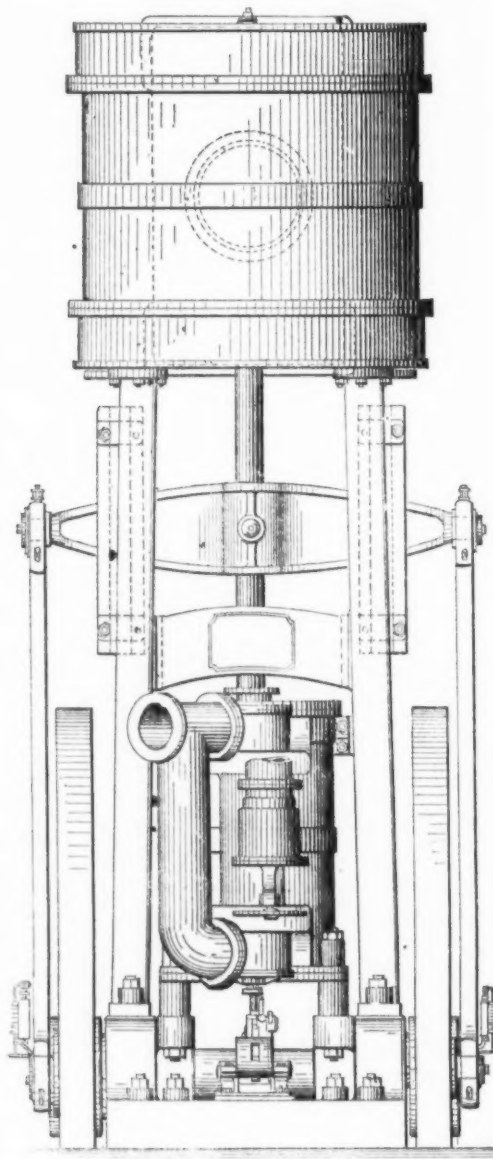
doah Furnace Company, of Milnes, Va. or cylinders. Both steam cylinder-heads are movable, without disturbing any other part. The piston-rod is continuous from one piston-head to the other, and is attached to the crosshead by a large steel pin, the rod being enlarged at the pin-

length in the adjustment of the connecting-rods.

The connecting-rods are of the improved form now used on the best modern horizontal engines, as shown in the illustrations, having solid ends slotted out for the



Side Elevation.



End Elevation.

BLOWING-ENGINE, BUILT BY WILLIAM TOD &amp; CO.

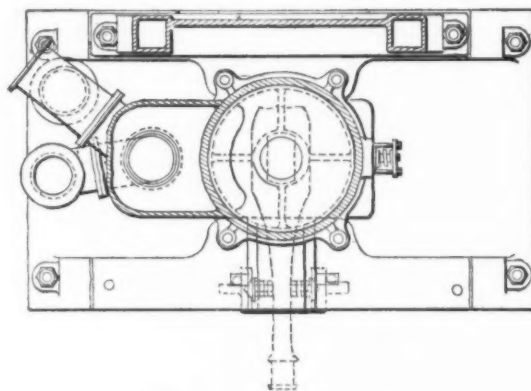
doah Furnace Company, of Milnes, Va. It is of the familiar vertical type, having steam-cylinder 38 inches in diameter, blowing-cylinder 84 inches in diameter and a stroke of 48 inches.

Perhaps the most noticeable external feature is the employment of a piston-valve on the steam-cylinder. This form of valve is very popular in marine practice, and is getting to be largely used in this country on high-speed engines. It possesses the advantages of being perfectly balanced, and is therefore easily worked by hand, and of being without balance plates or other loose pieces, of being extremely simple, and consequently not liable to derangement, and of enabling the exhaust to be made at the ends of the valve, thereby avoiding the necessity of packing the valve-stems against steam-pressure. The form of the valve and the steam-passages are plainly shown in the sectional elevation.

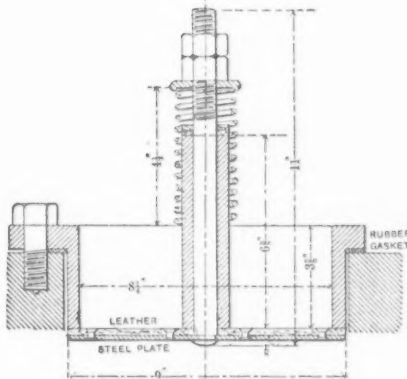
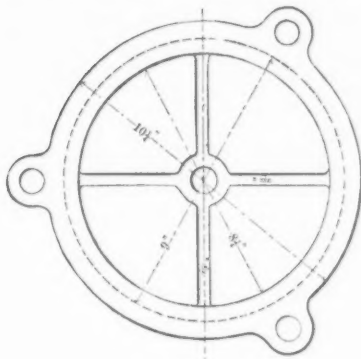
The bed-plate of the engine is very deep and is so constructed that the shaft may be raised out of the bearings without disturbing the housings

hole to maintain the section. The cross-head is a steel casting, very heavy, and flanged to an I-beam section. Being free to move in a plane of the center lines of the guides, it avoids the possibility of cramping the rod by any difference of

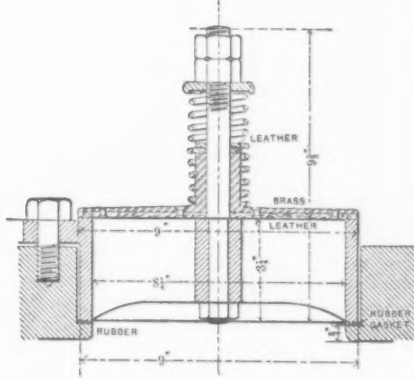
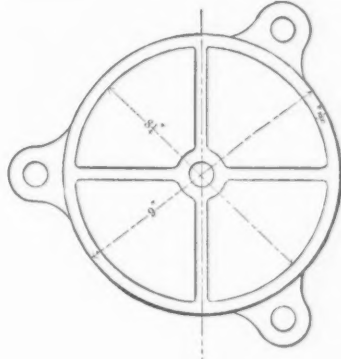
brasses. The inlet air-valves are round steel plates, faced with leather, placed in the cylinder heads, opening vertically into the cylinder, and closed by springs. The outlet-valves are similar in construction and of the same size as the inlet-



Sectional Plan through Steam-Cylinder.



Inlet-Valve.



Outlet-Valve.

valves, but made of bronze, with leather face. The air-valves are made as light as is consistent with strength, with light, closing springs, so as to open fully with very little pressure. These valves and their seats are all easily removable independently of each other. It will be noticed that this arrangement of the air-valves gives the least possible waste space or clearance in the blowing-cylinder, and the most direct ingress and egress for the blast. In this engine the total clearance is less than 2 per cent. of the piston displacement.

#### The Basic Steel Process.

We take the following extracts from an article contributed by Jacob Reese, of Pittsburgh, to the *Bulletin* of the American Iron and Steel Association: The basic process is so called because it is conducted in a basic-lined vessel and in the presence of a basic slag, while the Bessemer process is conducted in an acid-lined vessel and in the presence of an acid slag. Basic material is the oxide of metals, acid material is the oxide of metalloids. In the practice of the Bessemer process the vessel is lined with ganister, a kind of sand rock. This old Bessemer process requires pig-iron high in silicon to develop heat while burning it out in the converter. In converting the metal into steel this silicon is changed to silica. The steel so made always contains all of the phosphorus contained in the pig-iron, fuel and fluxes from which it was made and a considerable quantity of silicon and other impurities.

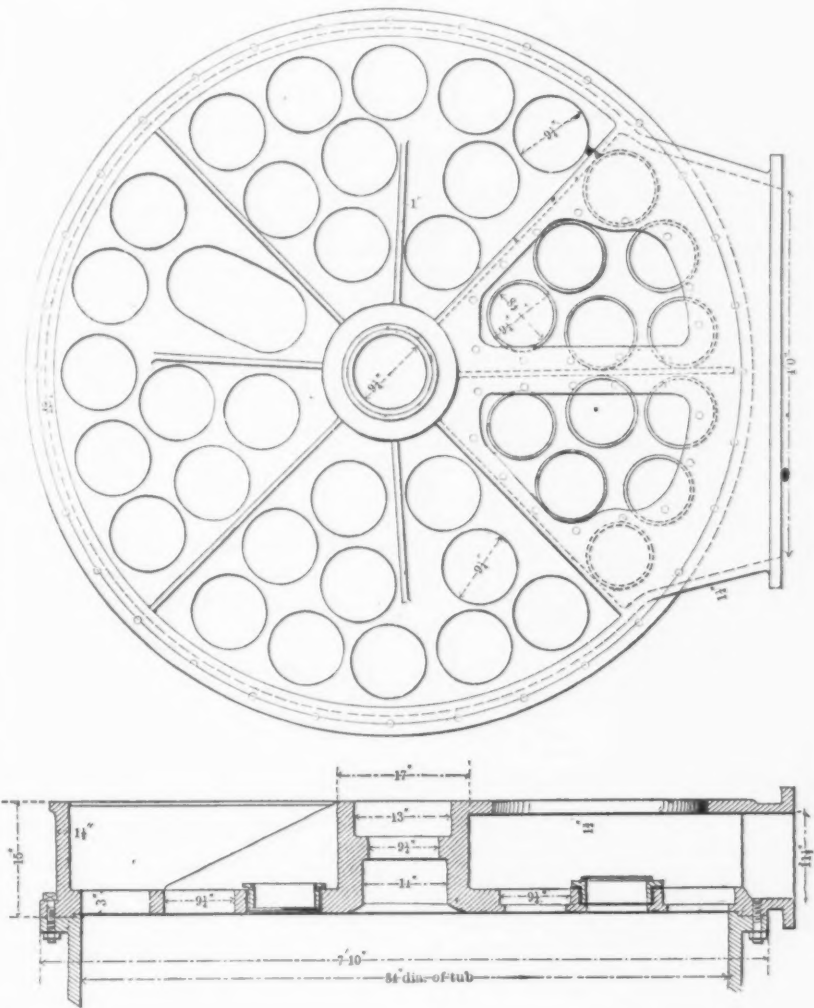
In the practice of the basic process ganister lining is not used, but lime, magnesite, chrome ore, or other basic material. The blast-furnace is worked in such a manner as to produce pig-iron for use in the basic process low in silicon, and by this means we avoid making the dirty slag in the converter that the acid process does in burning out a large amount of silicon. In order to develop the required heat in the basic converter we make the pig-iron high in phosphorus, and by burning the phosphorus into phosphoric acid we not only develop sufficient heat, but

degree. Thus, by working the metal in a vessel having a pure lining and a pure basic slag, a purer and consequently a softer and more ductile steel is produced than can possibly be made by the Bessemer or by any other process where a silicious slag is produced and maintained.

The basic process may be practiced in different ways. When practiced in a basic-lined Bessemer converter it is called the basic Bessemer process, and requires a metal containing not less than 2 per cent. of phosphorus and less than 2 per cent. of silicon; preferably 3 per cent. of phosphorus and less than one-half of 1 per cent. of silicon. The time required in making a heat is 20 minutes.

When the basic process is conducted in a basic-lined open hearth it is called the basic open hearth process, and may be practiced on metal containing phosphorus in all degrees and silicon in all degrees; preferably with phosphorus from 2 to 3 per cent and silicon below 0.50 per cent. The steel produced by the basic open hearth requires from 7 to 12 hours to a heat.

The basic duplex process consists in blowing molten metal with an air-blast while held in an acid-lined converter until the silicon is eliminated and the carbon is reduced to about one-half of 1 per cent., then transferring the desiliconized metal (minus the slag) into a basic-lined open hearth, and there boiling out the carbon and dephosphorizing the metal in the presence of a basic slag. This process will work metal of any and every quality. The



Plan and Section through Valve-Chamber.

the metal is cleansed of all its impurities, and a sufficient amount of that valuable fertilizer, phosphate of lime, is produced to reduce the cost of converting in a large

time required to make a heat by the basic duplex process is from three to four hours.

The basic Bessemer process may be practiced to advantage at Pottstown, Harris-



burg and at Pine Grove, Pa; at Waynesboro, Green Forest, Roanoke and New River, Va; at Knoxville, Athens, Cleveland and Chattanooga, Tenn.; from Dalton to Rome, Ga., and from Rome to Birmingham, Ala.; on Lake Champlain, N. Y.; at Portsmouth and Moxahala, Ohio, and in many other places where metal containing from 2 to 3 per cent. of phosphorus can be made to advantage. Milwaukee, Wis., is especially adapted to this process, there being a bed of iron ore 15 feet thick within 50 miles of the city which contains 54 per cent. of iron and 1.53 per cent. of phosphorus.

The basic open-hearth process may be practiced at all points in the United States where the acid open-hearth process is practiced. At Pittsburgh, Pa., Messrs. Carnegie, Phipps & Co., Limited, are making all their purest and best plate steel by means of this process. The Pennsylvania Steel Company have also adopted this process.

The basic duplex process may be practiced to advantage at Pittsburgh, Harrisburg and in Eastern Pennsylvania; at Richmond, Lynchburg, Low Moor, Milnes, Roanoke and Pulaski, Va.; from Knoxville to South Pittsburg, Tenn., and at all points where pig-iron can be made to advantage in Alabama and Georgia. It is especially adapted to make steel from the pig-iron made at Bessemer, Birmingham, and Sheffield, Ala.

Basic steel is in great demand for tin-plates, thin sheets for stamping into trays and domestic utensils, such as enameled and nickel-plated ware, for wire drawing, and drop forgings, because it is softer, tougher, and more ductile than the less pure steels made in the presence of dirty slags. It is also used largely for wire nails, boiler-plates and rivets, because of its homogeneity and toughness.

#### Coke-Workers Ask an Advance.

A delegate meeting of the organized and unorganized coke-workers of the Connellsville region was held at Scottsdale, Pa., on the 17th inst. The greater part of the time was occupied in discussing the question of an advance in wages. Several resolutions were adopted, among them being the following:

*Resolved*, That it is the sense of this joint convention that the Conference Committee selected by this body be authorized to demand a conference with our employers, said conference to be held at Everson on Saturday, July 27, 1889; that if our employers ignore our committee we call upon all workmen in the region to be prepared to lay down their tools and quit work on the 1st day of August; that it is the opinion of this convention that the following should be the minimum rates of wages for the different classes of work: \$1 per 100 bushels for mining room coal; \$1.30 per 100 bushels for mining heading coal and all other narrow work; \$2.10 per day of eight hours for drivers, cagers, horseback men, timber men, track men and rope-riders; chargers, 4½ cents per oven; 60 cents per 100 bushels of coal charged for coke-drawing; 10½ cents per oven for leveling; blacksmiths, \$2.50; carpenters, \$2.25; helpers, \$1.85; car greasers, \$1.75, and all other work to be paid in proportion to the above prices.

The coke operators do not view the resolutions with any alarm, as they claim there is no danger of a strike taking place. They further state that it will be impossible to grant any advance in wages until there is an improvement in the price of coke. From the present condition of the market and the outlook this will not occur for some time.

A pump worked by wave-power supplies salt water from the ocean to sprinkle the streets of Ocean Grove, N. J. The waves push backward and forward a swinging-door connected with the piston, thus lifting the water.

## AMERICAN ENGINEERS IN GERMANY.

(Editorial Correspondence.)

The heavy strain of sight-seeing, important business interests, the attractions of Paris or the charms of travel in France, Switzerland or Belgium made it impossible for the majority who had been the recipients of courtesies in Paris to accept the hospitality tendered by the engineers of Western Germany. A corporal's guard only gathered at the Nord station in Paris on their way to Aix-la-Chapelle, where the first meeting was to be held. Some of them stopped at Liège to visit the Cockerill Works at Seraing; others made a *dé-tour* via Bruxelles, and a few started to see the Robert process at Stenay. A small number, therefore, only were present at Aix-la-Chapelle. Still, by the time Düsseldorf, the final objective point, was reached, there were more than 40 engineers and their ladies who were fortunate enough to enjoy a fitting climax of their whole European trip. The party being smaller and consisting largely of men interested in iron and steel manufacture was more homogeneous and manageable. Its members became individually far better acquainted with their hosts. The days were spent in a business way, work being crowded into them which taxed the energies of the guests without apparently in the least impairing the endurance of the hosts, who generally contrived to send the American engineers to rest completely tired out but well content with their day's work and enjoyment. Americans are generally credited with an exceptional facility in accommodating themselves to whatever conditions they may be called upon to meet. They proved it by doing justice every day to at least two and generally more mid-day collations, with liquid refreshments at hourly intervals till after midnight. A particularly earnest effort was made to impress upon the visitors the merits of German champagne. It was obviously assumed that the taste could only be acquired after frequent and thorough trial. Your correspondent is inclined to believe that the converts were numerous. But seriously, the captivating charm of the hospitality of the German engineers was its sincerity and its heartiness, to which was added the fact that many spoke English very fluently, while nearly all could express themselves sufficiently well in the foreign tongue to make intercourse with their guests easy, while it had the zest due to the slight uncertainties and hesitations of such conversations.

After a short drive the party, on Tuesday morning, July 2, reached the famous

#### ROTHE ERDE WORKS

of the Aachener Huetten Actien Verein, remarkable for the high perfection to which the basic Bessemer process has been carried and its conversion into a wide range of finished products. The works are the outgrowth of an establishment founded in 1845, and like many others in different countries have been largely built out of profits. To-day the capital is far below the actual sums invested in plant.

The engineers were first conducted to that part of the plant most interesting to them, the basic Bessemer mill. The three converters are placed side by side, their axes, however, converging toward the center of the pit. The latter, which is deep as compared with the majority of our own modern works, is served by a ladle-crane and 12 smaller cranes. Back of the converters are five cupolas 3 m. (9 feet 10 inches) in diameter inside the shell, one of them being sufficient to melt all the iron required. The officers of the works state that their basic Bessemer mill was designed a few years since after thorough study of American practice, and they acknowledge

that the results as embodied in their plant have done very much toward raising it to the rank it occupies as the largest basic producer in the world. They are now making regularly from 3000 to 3500 tons of basic Bessemer steel per week. While this is certainly not a large product considering the size of the plant, it must be taken into account that practically it takes three converters running on the basic process to keep two constantly in shape for work. The item of repairs, therefore, remains a very serious one, but on the other hand, German steel managers agree in stating that the range of raw material is not so restricted as is generally believed, in America at least. A few years since it was widely stated that the basic process called for pig-iron as definite in composition as does the acid process. German engineers have learned during the past four years to handle a large variety of iron. They purchase supplies from a wider range of sources. Practically two considerations guide them in their choice, high phosphorus and low sulphur. The latter should not reach the maximum of 0.01 in the pig, though to some extent it can be counteracted by manganese, which is costly. Phosphorus should be 2 to 2½ per cent. for mild steel. The element which was once so dreaded by the steel-maker is now regarded as his best friend; in fact, the German steel trade is threatened with a phosphorus famine, queer as that may sound. The ordinary ore mixtures available, notably those of the great Minette district of Luxemburg, yield iron carrying only from 1 to 1.5 per cent. Double that quantity is necessary, the combustion of the phosphorus during the blow being required to supply the heat to carry on the operation to a successful issue. That additional quantity must be furnished, either by bog-ores rich in phosphorus or by puddle cinder. Banks of the latter which happen to have accumulated without being mixed with clinker, ashes, old brick, &c., have proved very valuable property, but the supply is practically exhausted now. Some of the German works have been forced, therefore, to import puddle cinder from England, and it is not without the range of possibility that high phosphorus ores low in sulphur may become very precious in the future. Another point was strikingly illustrated during the visits paid to a number of the German works. The same plant is used at different times to run the acid or the basic process. Nor was any disposition shown, as far as your correspondent could discover, to restrict the basic process to the manufacture of mild steel. It is employed, too, for the higher carbons—for instance, for rail steel. It is probable, however, that if the German works were called upon to deliver the tonnage which our American works find it economical to run on when making rails, they would prefer the acid process, since the quantities made per converter per unit of time are greater. Your correspondent was informed by one of the Westphalian engineers that 10 per cent. increase of product represented the difference between the two methods of working. This is, however, measuring them both by German standards.

At the Rothe Erde the converters, whose diameter is 3 m. (9 feet 10 inches) inside the shell, lined up to about 2.2 m. (7 feet 2 inches), have a capacity of 12 tons and a yield of 10½ tons of ingots. At Rothe Erde, and in fact at all the works, the basic lining is rammed and the bottoms are made in the same manner. The dolomite is calcined in a cupola furnace at a high heat, the consumption of coke being 10 per cent. It is then ground to a powder and is mixed with 7 per cent. of tar, previously boiled to get rid of those lighter hydrocarbons which have not been expelled before delivery. The tar is raised to the mixing tank by a Körting in-



jector. For making bottoms the dolomite and tar are rammed by hand in an iron form in place. The tuyeres are made by ramming around 84  $\frac{3}{4}$ -inch iron rods, the thickness of the bottom being about 24 inches. The rammed bottom, resting on a car, is run into an oven very similar to a core oven. Entering at the cool end it is gradually transferred to the hotter end, and is thoroughly baked in a number of days. It is then a hard mass, having a metallic ring. The bottoms are lifted into place by a hydraulic ram, the joint being made by pouring in a few buckets of tar. At its maximum width this joint is 15 mm. ( $\frac{5}{16}$  inches). The life of a bottom is given as 20 to 22 blows. The body of the converter is lined from the bottom up, first with six courses of 25 cm. (9  $\frac{1}{2}$  inches) basic brick, rammed in forms and baked in the same way as the bottom. The rest of the lining is rammed in place, over a sectional iron form. Its life is reported to be about 150 blows. The Rothe Erde Works propose at an early day to give a trial for ramming bottoms to a mechanical apparatus, which it is hoped will prolong the life of the bottoms and lessen the cost.

During the blow from 18 to 20 per cent. of lime is added, being dropped into the converter through overhead shutters. The steel is cast into ingots, varying in size according to the weight of the product to be made, the works going further in that direction than is usual in American Bessemer mills. The length of the after-blow varies according to the phosphorus contents of the metal. The blower possesses no direct means of indicating its end by the change in the color or brightness of the flame. It is a matter of experience. A forging test of a small sample is made, and that alone can serve as a guide. Every carload of pig-iron received is analyzed for phosphorus and for sulphur, and a phosphorus determination is made of every cast of steel. A sample ingot is rolled down to a rod, and is subjected to torsion and tensile tests, varying of course with the character of the product and the specifications prescribed for it.

The Rothe Erde Works roll I-beams up to 400 mm. in height (15  $\frac{7}{8}$  inches) and are preparing to go up to 500 mm. (19  $\frac{7}{8}$  inches). The present train is three-high, with 800-mm. (31  $\frac{1}{2}$ -inch) rolls. On the rollers' side there are large hydraulic lifting roller tables on the first and second roughers' sets, there being no lifting table at the finishing. A set of reversible rollers at the floor level carries the material to the saws and then on the hot-bed. A pull-out on the hot-bed with fingers carries the material off the saw-bed to the cooling-bed. On the catchers' side of the beam mill there are no lifting tables, but an overhead lifting run at each set of rolls. The work is done with ordinary hooks in the finishing mill, and on the catchers' side a beam is suspended from the run which is guided by two men. The train is driven by a 2000 horse-power horizontal engine, and is served by two heating furnaces which, like all the others in the mill, are designed on the Bicheroux system.

The company are building a new 950-mm. (37  $\frac{1}{2}$ -inch) reversing blooming mill, driven by a horizontal two-cylinder 44 x 50 inch engine, geared 1 to 2  $\frac{1}{2}$ . A particularly interesting feature of the design is that the whole of the train and the tables are commanded by a 10-ton overhead traveling crane. The housings are closed in at the top; they have no cap and are wide enough to pass the boxes. In this manner the rolls can be changed by moving them sidewise through the ends of the boxes. The designers of this mill, officers of the Rothe Erde Works, expect to effect a very considerable saving of time through this arrangement, the usual construction requiring about two days to change rolls.

The works possess, besides, a 650-mm. (25  $\frac{1}{2}$ -inch) train for billets, slabs and I-beams, driven by a 1700 horse-power engine, and a 650-mm. (25  $\frac{1}{2}$ -inch) train for rails, ties, angle-bars, &c. The latter rolls 120 to 150 tons three-length rails, 32 kg. weight per m. (about 70 pounds) in 19 passes, from a 380-mm. (14  $\frac{7}{8}$ -inch) square section. A third 650-mm. (25  $\frac{1}{2}$ -inch) train and two 550-mm. (21  $\frac{7}{8}$ -inch) trains, driven by engines of 1020, 900 and 800 horse-power respectively, are employed for making shapes of medium weight. Two smaller trains are used for merchant iron. An old muck train is occasionally needed to handle a small quantity of puddle bars made annually.

The entire equipment may seem very extensive in view of the tonnage made. It is the result, however, of the fact that orders for different sizes are small, so that rolls must be frequently changed. As a matter of fact, one of the three trains on smaller sizes is always off, changing rolls. In addition to the plant referred to, the mill has a Belgian rod train. Starting with a 2-inch square billet the train rolls to a No. 6 rod in seven roughing and nine finishing passes, the finishing-mill delivering at the speed of about 10 feet a second. The product is about 25 to 30 tons per ten hours with one furnace. Seven men and two boys are at the mill. The train is operated by a two-cylinder engine running at 80 to 84 revolutions, with a 25-foot fly-wheel, and rope transmission of 2 to 1 to the finishing and 2  $\frac{1}{2}$  to 1 to the roughing rolls.

The works have, besides, a wire-mill and wire-nail works, foundry and repair shops. An older three 7-ton converter Bessemer plant has been idle since the new basic plant has been in successful operation.

To the American engineers one of the most interesting department was

#### THE BASIC-SLAG GRINDING MILL.

All the slag made in the converters is cast into tank-cars and is hauled to the grinding mill, the practice of many of the German basic works being to place this subsidiary department in the hands of outside parties. At Rothe Erde, however, the company run their own mill, selling the ground product to a contractor. The slag as it comes to the mill is still partly liquid. It is poured in iron plates in a thin stream, which facilitates breaking. The material is then charged into rock-breakers, from which it is carried by bucket elevators to the upper story of the mill. It is, of course, mixed with pieces of steel, and shots of the latter permeate the mass. Since these are highly destructive to the grinding machinery, they must be picked out as thoroughly as possible. Preliminary cobbing before breaking may remove the larger masses, but the smaller shots must be taken out by machinery. This is effected by magnetic separation. At Rothe Erde two machines are in use, both built by Kessler, of Oberlahnstein. The first, for coarser stuff, consists of two drums, over which passes a broad leather belt studded with flat fingers of soft iron about 1 inch broad,  $\frac{1}{4}$  inch thick and 2 inches high. A core in one—the larger—drum is rendered magnetic by a dynamo. While within its range the studs on the belt are capable of holding the shots and pieces of steel which fall upon them with the cinder. They drop them away from the latter as they recede from the magnetic drum. Another machine, used for finer stuff, is built on the same general principle, except that the studs themselves are permanent magnets, from which the adhering bits of steel are brushed off when they pass over the periphery of that drum which lies opposite to the drum upon which the stuff is delivered. These machines do good work, but yet do not succeed in removing

all the particles of steel. After being thus cleansed so far as practicable the coarse cinder is ground on ordinary burr stones, the requirement being that 75 per cent. of the ground product must pass through a screen having 900 meshes per square cm. ( $\frac{1}{16}$  inch). In spite of an elaborate and effective system of exhausting the dust from the machines in use by fans the wear and tear is excessive. We understand that the life of the plant, costing about 70,000 marks (\$17,500), exclusive of engine, is not greater than two years, the fine grit cutting bearings, &c., very rapidly. Still the utilization of basic cinder for agricultural purposes, containing as it does from 16 to 17 per cent. of phosphoric acid, has proved a valuable source of revenue to the German works, the ground stuff selling at 20 to 25 marks a ton, while the cost of grinding is only about 14 to 15 marks. What would otherwise be a cumbersome by-product has become valuable. It should be stated, however, that from the consumer's point of view the new fertilizer is not all that it has been credited with being. The tests were often made with cinder produced with special care to avoid the use of an excess of lime in blowing. Now, the steel-works cannot afford to take any chances on the removal of phosphorus by running close on the quality of lime additions. They must be liberal for safety's sake, so that the cinder always contains an excess of lime. When that is hurtful or unnecessary from the farmer's stand-point the use of raw ground basic cinder must be restricted.

The Rothe Erde Works rank among the largest in Germany. In 1888 the product was 141,486 tons of basic ingots and 11,746 tons of puddled blooms. The rolling-mills turned out 152,254 metric tons (2204 pounds each) of merchantable goods and 1150 tons of drawn wire and wire nails. They consumed 185,913 tons of pig, 98,529 tons of coal, 19,205 tons of coke, 6458 tons of dolomite, 26,519 tons of lime and 3882 tons of limestone; paying in wages and salaries 2,210,552 marks to about 2300 employees.

After making the rounds of the works, the engineers gathered in the handsome office building and partook of a collation, which was followed by English and German speeches. It was here that our hosts for the first time heard the ringing three cheers with the puzzling "tiger," in which, through the frequency of the thanks it was intended to express, the American visitors acquired a startling precision.

**New Iron Works in Algeria.**—It is said that the company owning the magnetic iron-ore mines of Mokta-el-Hadid, in Algeria, are about to build blast-furnaces to smelt it on the spot. This scheme has been rendered practicable by the progress made in recent years whereby the consumption of coke per ton of pig smelted has been greatly reduced. The ore is not sufficiently rich to bear the costs of long carriage. The furnaces are to be built at the port of Beni-Saf, in the province of Algiers, near the frontier of Morocco, and the coke or perhaps the coal for the manufacture of coke is to be imported from England. For the present the pig will not be consumed on the spot, but at a later period works for the production of finished iron may be erected.

Increased postal service, as compared with last year, indicates an increasing activity, but not more than would be expected from the growing population. Thirty of the larger post-offices in the country report for the quarter ended June 30 aggregate receipts equal to \$5,402,706, which is 8 per cent. more than for the same time in 1888.

### Cold Saw Cutting-Off Machines.

This machine is designed for cutting off work of any shape, and has, therefore, a much wider range than those machines which are only capable of cutting round stock. In this machine stock of any shape is cut off by means of a large milling-cutter or saw which can be used for cutting off perfectly square, or to an exact

Maine is pretty well scattered along the coast. Mr. Palmer, in speaking of the matter, said that at one time he despaired of getting the work sublet. As it is now issued it is in the hands of specialists. This is not only cheaper for the Quintards, but it insures better work. The furnaces, for instance, are being made by the only firm doing such work in the United States. The engines of the Maine will be among

gan in earnest at Nanaimo in 1852, and before the close of 1853 2000 tons are reported to have been shipped, chiefly to San Francisco. The price of coal at Nanaimo was at this time \$11 and at San Francisco \$28 a ton. The Hudson Bay Company, under the name of the Nanaimo Coal Company, continued to work the mines thus opened till 1861, when these were sold to the Vancouver Coal Mining and Land Company, Limited, by whom they are still operated. The total shipments from October, 1852, to November, 1859, are returned at 25,398 tons. The Wellington Mines, situated a short distance inland from Departure Bay, near Nanaimo, began to produce coal in 1871, and several hundred tons of coal were shipped in that year. This colliery, like the last, has since continued in active operation, with yearly-increasing output, and from the various openings belonging to these two enterprises by far the greater part of the coal product of the province is obtained. In 1871 mining operations were in progress at Cowgitz, Queen Charlotte Islands, and several hundred tons of anthracite were shipped, but the work was not continued. The annual production of coal by all the mines of British Columbia since 1874 has been as follows in tons of 2000 pounds:

	Tons.
1874.....	81,547
1875.....	110,145
1876.....	139,192
1877.....	154,052
1878.....	180,846
1879.....	241,301
1880.....	267,595
1881.....	228,357
1882.....	282,139
1883.....	213,299
1884.....	394,070
1885.....	365,596
1886.....	326,636
1887.....	413,360
1888.....	489,301

angle, or cutting the work off to exact lengths. An important point in the construction of the machine is the method of clamping the saw to the spindle. The saw is clamped between two collars, the back collar being made with a thread to screw on the end of the spindle. When required the collars can be unscrewed from the end of the spindle and a large face-cutter can be screwed in its place, to be used for milling off the ends of work when desired. The machine can then be used as an ordinary face-milling machine or rotary planer when not in use as a cutting-off tool. The milling cutters or saws are hollow-ground and run in a bath of oil or soda-water, which keeps them cold and lubricates the cutter. The spindle is of hammered steel, extra large, and is driven by a worm-gear, as shown in the engravings. Both of the machines of which we present cuts have automatic variable feed and automatic quick return. In that represented by Fig. 1 the saw is 18½ inches in diameter and will cut off 4-inch round and 4-inch square or an I-beam 16 x 4½ inches. In the second machine the saw is 30 inches in diameter and will cut off square or round up to 7 inches or an I-beam 32 x 8 inches.

These machines are made by the Newton Machine Tool Works, of Philadelphia, Pa.

The sublet work on the engines of the armored cruiser Maine has been issued by the Quintards, of this city. The Standard Steel Company have been awarded the making of all the steel castings for the Maine's machinery. The Bethlehem Iron Company have secured all the work for the shafting and heavy steel forgings. The Linden Steel Company, of Pittsburgh, are making the steel boiler-plates and steel blooms for miscellaneous forgings. The Tyler Steel Tube Company, of Boston, have been awarded the making of the steel boiler-tubes. The Continental Iron Works, of Brooklyn, are making the corrugated furnaces. The Southwark Foundry and Machine Company are doing the cylinder work. The South Brooklyn Steam Engine Works are making the condensers. It will be seen that the work for the

the most powerful ever turned out in this country. Some idea can be had of their cost when it is known that the contract price, according to specifications, is \$700,000.

### Coal and Iron in British Columbia.

From a report on the mineral wealth of British Columbia made by George M. Dawson to Dr. Alfred R. C. Selwyn, di-

The series of mineral fuels presented by British Columbia range from anthracites which compare favorably with those of Pennsylvania and Wales, to lignites, in which the original woody structure is still clearly preserved. The beds containing

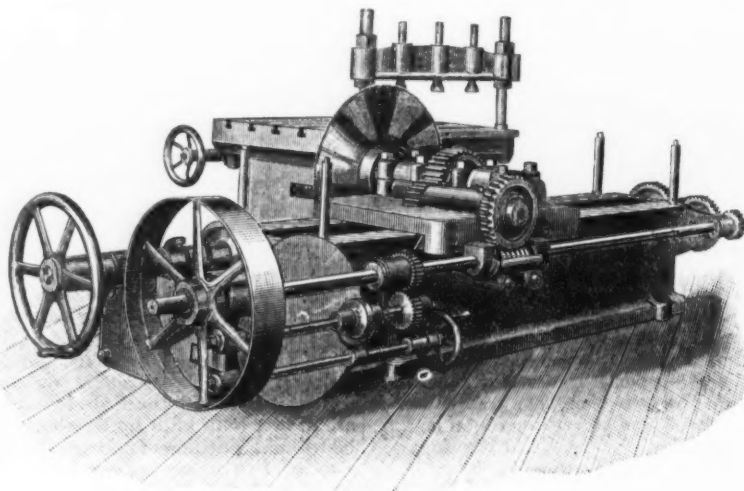


Fig. 2.—Cold Saw Cutting-Off Machine with 30-Inch Saw.

rector of the Geological and Natural-History Survey of Canada, we take the following references to coal and iron ore:

#### COAL.

The discovery of coal in British Columbia antedated that of gold by more than 20 years, but did not at first produce any effect comparable with that of gold upon the history of the country. Dr. W. F. Tolmie was the first to make known the existence of coal on the coast of the province in 1835. Specimens of coal were brought to him by Indians from the north-east coast of Vancouver Island. Work be-

the anthracite are almost vertical, and it is evidently on account of the disturbance and local alteration which it has suffered that the coal has passed into the condition of anthracite. The best seam found had a maximum thickness of a little over 6 feet, while a second outcrop showed 2 feet 5 inches, and, other less important outcrops also occur. Mr. Richardson was originally of opinion that several distinct seams exist at this place, but it now appears more probable that the various outcrops represent a single seam, repeated by folding. In composition, the anthracite



of the Queen Charlotte Islands compares favorably with that from Pennsylvania.

The Comox and Nanaimo coal-fields are the most important in the province, and the latter is that from which almost all the coal so far raised has been obtained. The cretaceous rocks constituting these coal-fields border the southwestern side of the Strait of Georgia, forming a belt of comparatively low rolling or hilly country between the mountainous region of the interior of Vancouver Island and the coast. The quality of the Comox coals is equal if not somewhat superior to that of those of Nanaimo. They contain but a small percentage of water and the ash is also often very low. Several of them yield strong cokes. The area of the Nanaimo coal-field is estimated at about 200 square miles. There are at least two distinct seams of workable thickness in this area, but in consequence of folds and faults it is not easy to fix the equivalency of beds in its various parts. Three collieries are at present in operation here, the Nanaimo, Wellington and East Wellington. The works of the two first-named are on a very extensive scale, embracing numerous shafts and inclines, provided with good machinery, railways and wharves. In the Vancouver colliery the principal workings are upon a seam which averages from 6 to 10 feet in thickness. A second seam, overlying the last and separated from it by 140 feet of sandstone, is 7 feet thick. The seam worked in the Wellington colliery averages about 9 feet in thickness, and yields a rather dry steam coal which does not afford a strong coke. The coal from the Vancouver colliery, on the contrary, gives a good coke and produces a large quantity of illuminating gas.

#### IRON ORE.

Comparatively little attention has yet been given to iron ores in British Columbia, in consequence of the impression that under the present conditions they possess little or no value.

Most of the ores of iron so far found in quantity are magnetites, which occur in association with the older metamorphic rocks of the province. Clay iron-stones are, however, of frequent occurrence in the coal series of Vancouver and Queen Charlotte Islands as well as in the tertiary rocks of the interior.

The only iron-ore deposits which have yet been worked are those of the southwest side of Texada Island, the largest exposures of ore occurring about three miles northwest of Gillies Bay. Here the ore mass is seen to be from 20 to 25 feet thick, and constitutes a somewhat irregular contact deposit between limestone or marble and granite, thin veins of the ores being occasionally found reticulating the limestone. From this point to the northward, for nearly a mile, the ore is occasionally seen, and at one place there is a continuous exposure about 250 feet long and from 1 foot to 10 feet thick. As regards mining and shipment, the ore is most favorably situated.

The ore is a magnetite of excellent quality. A partial analysis by Dr. B. J. Harrington, in the laboratory of the survey, shows 68.40 per cent. of iron, with only 0.003 per cent. of phosphorus. A partial analysis by Whitfield, representing a lot of 600 tons, shows iron, 65.71; phosphorus, 0.013. A more detailed analysis carried out by Messrs. P. C. Gilchrist and E. Riley, on specimens sent to the Colonial and Indian Exhibition in 1886, is as follows:

Iron.....	69.85
Manganese.....	trace
Siliceous matter.....	2.75
Sulphur.....	0.06
Phosphoric acid.....	trace
Moisture.....	trace

At the principal deposit of ore, situated as above described, a wharf has been

built, and excellent arrangements made for mining and shipping. The ore is brought to the wharf by an incline nearly a quarter of a mile in length from the point at which it is quarried out, about 250 feet above the sea-level. Considerable quantities of ore have been shipped from time to time to the works of the Puget Sound Iron Company, situated at Irondale, Wash. Ter. The Texada ore is there mixed with from one-ninth to three-tenths

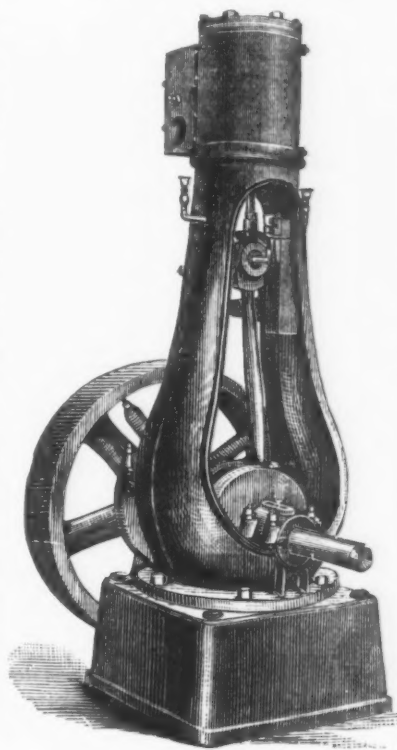


Fig. 1.—The Williams High-Speed Vertical Engine.

bog-ore, found near Irondale, and produces thus or when smelted alone an excellent quality of foundry pig.

The shipments in 1885 amounted to 190 gross tons; in 1886, 3941 tons; in 1887 to 1410 tons, and in 1888 to 7300 tons, valued at \$18,400.

Iron-ore deposits of the same character and in considerable mass are again found

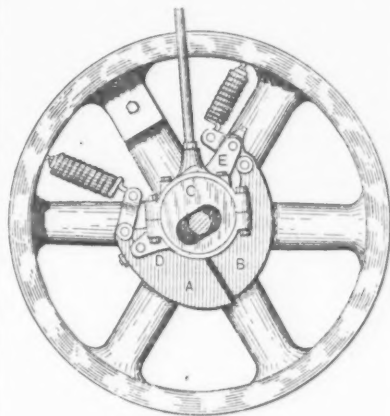


Fig. 2.—Side View of Governor.

on the opposite or northeast shore of Texada Island, and very probably are more or less continuously developed along the contact of the granites and limestones elsewhere in the island.

Magnetic iron ores of somewhat similar character occur in the hills to the east of Sooke Harbor, Vancouver Island. The deposits are on sections 79 and 83, Sooke district, at a distance of about 20 miles

from Victoria, near the coast, and well situated for shipment. The deposit is rather of the nature of a stoke-work than a true vein, but can be traced for some distance in a northeast-southwest direction, and in places shows from 10 to 20 feet of nearly pure ore. The country rock is a coarsely crystalline diorite (?), containing much hornblende.

Magnetic iron ore occurs in considerable mass in the Queen Charlotte Islands, on the east side of the entrance to Harriet Harbor, Skinkuttle Inlet. No attempt has, however, yet been made to utilize this ore. Occasional strings of pyrites traverse the ore, but it is, as a rule, remarkably pure. Specimens of an average character, collected by myself in 1878 and examined in the laboratory of the survey, proved to contain 58.06 per cent. of metallic iron, while an exceptionally good fragment yielded 69.88 per cent.

Very pure specimens of magnetite have also been brought from an island in the Walker group, in Queen Charlotte Sound, near the north end of Vancouver Island. These proved to contain 71.57 per cent. of metallic iron. Another specimen of a similar ore comes from a deposit, which is reported to be extensive, on the north side of Rivers Inlet, about 25 miles up from its entrance.

#### Vertical High-Speed Engine.

The accompanying engraving represents a new design of vertical high-speed engine, built in three sizes of 4, 8 and 12 horsepower by the Williams Engine Works, of Baltimore, Md. The piston is a hollow casting shrunk on the rod and is provided with plain spring rings. The connecting-rod is so constructed that as the brasses wear it retains its original length, thereby preventing any liability of the piston striking either end, in which the clearance spaces are unusually small. The valve is balanced and consists of a flat plate working between two parallel faces, one of which is an adjustable plate placed in inclined ways in the bonnet and provided with a relief plate in the back. Steam passes in through the central port and exerts a pressure on the plate, which is kept down to the valve. The wear of the valve can be taken up by means of a set-screw, which can be adjusted to move the plate down the inclined way until it comes in contact with the valve. This adjustment is best done while the engine is running.

The governor, shown in side view, consists of two weights, A B, and one eccentric, C. The weights are hung on large steel pins set in two arms of the wheels, one weight being ahead of its fulcrum and the other weight being behind it. The eccentric has two arms, D E, cast on it, in the end of each of which is secured a steel pin which fits a hole in each weight. As the weights travel downward the eccentric is carried across the shaft in a straight line, so varying the travel of the valve. The lead always remains constant. An important feature of the governor is that it can be oiled while running. Each engine, before being sent out, is tested under steam with friction brake, and is indicated to ascertain its exact condition.

Consul Smithers, at Tien-Tsin, China, says that if American manufacturers of cotton sheetings and drills expect longer to control that market they must oppose English imitations by producing a cheaper article expressly to meet the wants of the poorer classes. In this cheap trade the English are practically without a rival. The same remark in reference to adaptation to the wants of consumers applies equally well to other markets and other descriptions of merchandise.



### The Mullins Silica Process.

The discussion in iron circles of the use of high-silicon pig-iron to soften foundry mixtures is constantly widening. Few foundry men are to-day ignorant of the results following the use of pig-iron containing a good percentage of silicon. Excellent results are reported to have been accomplished in the same line by the use of silica in place of high-silicon pig-iron. The Mullins Silicated Iron and Steel Company have sufficiently introduced their process among manufacturers of iron and steel to claim that it has now been well established. From a pamphlet issued by the company we have obtained a few facts regarding it.

The silica process is a simple and novel use of comparatively pure silica ( $\text{SiO}_2$ ) as a helper in the manufacture of superior iron and steel. It needs no special plant nor any additional machinery, and is not confined to any particular department of the iron industries, but is applicable to all processes for the production of cast-iron, wrought-iron, steel and cast-steel. By "silicated iron and steel" is meant that the metal has been specially treated with silica.

G. G. Mullins, the inventor of this process, claims to have discovered a regular and scientific way to use silica as an ally to help purify, change and strengthen metal—to render both iron and steel homogeneous, fine-grained and comparatively free from porosity.

The following benefits are named as the direct and indirect results of his silica treatment: It makes an acid slag and removes the oxide of iron; lessens the amount of carbon in the iron; promotes the formation of graphitic carbon and antagonizes the formation of combined carbon; changes the hard, white irons, the combined-carbon irons, old burnt-out irons and inferior scrap into soft, tough gray irons; liberates the occluded gases, leaves the molten metal quiet in bath, ladle or mold, and renders the product comparatively free from porosity; helps the elimination of sulphur and phosphorus; it diminishes the tendency to shrinkage and cracking in castings; leaves the castings cleaner when they come from the molds; diminishes fully one-third the quantity of ferromanganese used in steel-making; augments the electrical conductivity of steel wire, and increases the tensile and resilient strength of iron and steel. A series of comparative trials in cupola practice, made in 1887, showed very important results. First, a number of heats were made with 20 per cent. of silicon pig in the mixture, and tests were made of the product. Then the same number of heats were made, treating the same mixture, 20 per cent. of silicon pig and all, with pure silica, and again the product was tested. The operations were witnessed and the tests made by disinterested parties. The result showed that the silica process had improved the product an average of 15 per cent. in tensile strength and 40 per cent. in resilience.

Prof. J. B. Johnston, of Washington University, made a large number of tests of this process in 1888. In cast-iron he obtained the following results, showing the tensile strength of identical mixtures:

Total number of tests.....	28
Total number of silicated.....	14
Total number of non-silicated.....	14
Average tensile strength of silicated iron, pounds.....	25,400
Average tensile strength of non-silicated iron, pounds.....	20,720
Average excess of silicated over non-silicated, pounds.....	4,680
Average percentage of increase.....	22.6
Maximum strength, silicated, pounds.....	31,570
Maximum strength, non-silicated, pounds.....	24,530
Minimum strength, silicated, pounds.....	19,760
Minimum strength, non-silicated, pounds.....	16,550

The greatest increase of strength was from 19,410 to 28,800, or an increase of 48 per cent. The least increase of strength was from 23,500 to 24,500, or an increase of 5 per cent., as a result of the silicated treatment, the mixtures otherwise remaining the same.

Resilience tests on identical mixtures of cast-iron showed the following results:

Total number of tests.....	16
Total number of silicated.....	8
Total number of non-silicated.....	8
Average resilience of silicated.....	107.5
Average resilience of non-silicated.....	56.6
Excess of silicated over non-silicated.....	50.9 = 90%
Greatest resilience, silicated.....	140.0
Greatest resilience, non-silicated.....	111.0
Least resilience, silicated.....	48.0
Least resilience, non-silicated.....	23.0

In the language of Professor Johnston, "the silicated process increased the ability of these eight mixtures of cast-iron to withstand shock by an average of 90 per cent., or it nearly doubled the strength of the iron, if it were to be broken by shocks or blows of any kind. Or in common language we might say it makes the iron more malleable."

Another pamphlet is published by the company giving the names of foundries which have tested the process and their recommendations of its efficiency. Among them are the Butchers' Supply Company, the Smith Feed-Water Heater and Purifier Company, J. A. Crossman & Co., Green's Car-Wheel Mfg. Company, and the Mac Murray-Judge Architectural Iron Company, all of St. Louis, and the Union Foundry and Pullman Car-Wheel Works and the Chicago Foundry Company, of Chicago. The testimonials of these foundry men are remarkably vigorous and emphatic. All seem to be thoroughly satisfied with the merits of the process. The method of using the silica is not stated in the company's pamphlets. It is only to be had on application to the Mullins Silicated Iron and Steel Company, 411 Olive street, St. Louis, or their branch office in Room 220, First National Bank Building, Chicago.

### A Treasury Decision on Drawbacks.

Assistant Secretary Tichenor has written the following letter to the Collector of Customs at New York, dated June 24, but just published in full:

On handles made wholly from galvanized wire No. 9 manufactured from imported spelter, and iron rods or bars, billets or blooms, and attached to tin cans exported with benefit of drawback under Sections 3019 and 3020 of the Revised Statutes as amended by the act of March 10, 1880 (21 Stat., p. 67), a drawback will be allowed equal in amount to the duty paid on the imported materials used in the manufacture of such handles, less the legal retention of 10 per cent.

The quantity of the material so used will be determined by allowing for each thousand handles, weighing not less than 31 pounds to the thousand,  $1\frac{5}{16}$  pounds of spelter and (as the case may be) 31 pounds of iron rods, or 33 pounds of iron bars, billets or blooms, and for each thousand handles, weighing not less than 28 pounds to the thousand,  $1\frac{1}{4}$  pounds of spelter and 28 pounds of iron rods, or 31 pounds of iron bars, billets or blooms.

The exporter of the cans shall file at the custom-house at which the drawback entry is to be lodged a bill of sale from the manufacturer of such galvanized handles, specifying the number of the handles sold, divided into classes of 28 pounds and 31 pounds to the thousand, the name of the purchaser and date of sale.

The exporter shall also file an affidavit by the proprietor and foreman of the factory where the handles were made, describing the material used by invoice-marks and numbers, and other particulars as required in the case of an entry for

drawback under Article 967 of the General Regulations.

The manufacturer of the cans shall incorporate into the usual affidavit a statement of the number of galvanized-wire handles affixed to the exported cans, stating the weight per thousand handles, and showing that the handles were a portion of those described in the bill of sale filed at the custom-house on a given date.

### The Archer Gas-Producer.

The Star Glass Works, at Norristown, Pa., have recently been equipped with an Archer water-oil gas-producer. This producer, as described, occupies a space of about 6½ feet square. It is fed with crude petroleum forced by a very small pump from an iron reservoir buried under the ground near the railroad tracks, where it is filled direct from the car. This tank has a capacity of 5000 gallons. During its passage from the pump to the "thermogen" the oil is heated by passing through a coil of pipes forming part of the apparatus. On reaching the vaporizers the oil is brought into contact with steam (in the proportion of one part of oil to three parts of steam) superheated in a similar manner, by which it is instantaneously decomposed, and a gas of great heating power is the result. The instant the gas is made it passes through two 2½-inch iron pipes into the "checker-work" chambers beneath the furnace or pots in which the materials for making glass are melted. The gas pours up one chamber, meeting a current of cold air drawn in through another chamber. The moment the two currents of gas and air meet, combustion takes place. The heat and accompanying flame pass under the bed of the furnace to the opposite side, where there is a pair of chambers similar to those above mentioned. A reverse valve opens these chambers, there is another meeting of currents of gas and air and consequent combustion, and the current of heat travels in the opposite direction. This alternative opening and closing of the two sets of chambers, or supply-pipes, is continued throughout the process of heating. Under the peculiar construction of the chambers, all the waste heat is taken up and utilized before it passes out through the escapes or exhausts.

The owners of the glass-works claim that by the introduction of this process they will save 50 per cent. in fuel and make a better quality of glass than with coal. The Archer process is now in successful operation at the Bethlehem (Pa.) Iron Works; the Pennsylvania Steel Company's works, at Steelton, Pa.; the Otis Steel Works, at Cleveland, Ohio; the Oliver Chilled Plow Works, South Bend, Ind.; the Detroit (Mich.) Steel and Spring Works, where, in addition to melting, it operates a battery of eight boilers; the Lincoln Iron Works, at Boonton, N. J.; the Illingworth Steel Works, at Newark, N. J.; the Joliet (Ill.) Steel Works, and in other iron mills. The fact that the producer itself is so small that it does not encroach upon valuable space is expected to make it of great importance on shipboard, where spaces unfit for cargo, such as water-ballast tanks, double bottoms, &c., can be utilized for oil, while owing to the less weight and bulk of fuel carried, increased capacity is made available for cargo or stores.

It is surmised that a recent purchase of a strip of land across the meadows between Jersey City and Newark secures the right of way for the Lehigh Valley Railroad by a new route, especially as it is in line with the old Morris Canal, belonging to the same company, which could be converted into a substantial road-bed.

**Robie Screw-Jack.**

We present in this issue illustrations of the Robie Patent Screw-Jack. One illustration shows the jack ready for use, the other gives a sectional view. The various parts are lettered as referred to below: A is a screw-pedestal, made hollow for the reception of the power-screw C and flaring at the lower end to form the base or support. In the upper end of the pedestal is a circular groove, A, and another groove, C, is turned in the side of the pedestal a short distance below the upper end. The hooded nut B extends over the side and is held in place by a set-screw, which revolves in the groove C so that the nut B cannot be accidentally detached if the jack is upset. A series of balls is interposed between the upper end of the pedestal and the bearing surface of the nut B, and the power-screw C passes through the nut B, by which it is worked. The upper end of the screw C is furnished with a removable head or rest, F, to give it a wide bearing at its points of contact with the weight to be raised. The power-nut B is provided with openings for receiving the operating

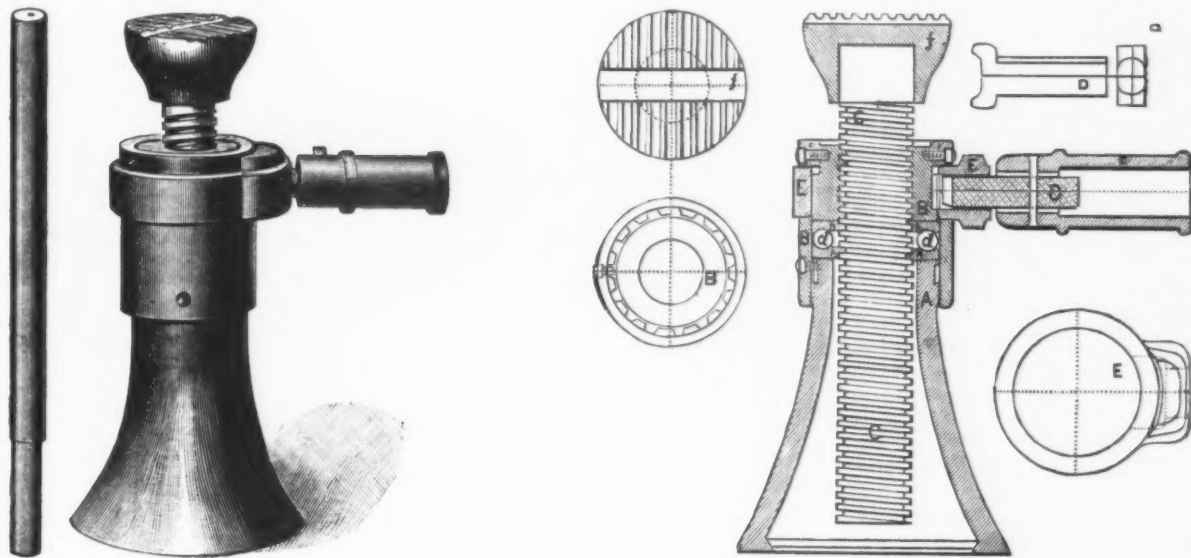
a glance. The character of the ore produced is indicated by appropriate marks. We have not space at present to publish the details given by Mr. Smock relative to the operation of the different mines, but give below a table showing the statistics of the production of iron ore in the several districts in New York.

Districts.	United States census year 1879-1880.	1888.
	Net tons.	Gross tons.
1. Highlands of the Hudson—magnetic iron ore.....	184,859	114,000
2. Adirondack region, including the Lake Champlain mines—magnetic iron ore.....	742,865	812,000
3. Jefferson and St. Lawrence counties—hematite.....	94,765	110,000
4. Ontario, Wayne and Cayuga counties—Clinton fossil ore—hematite.....	85,442	75,000
5. Dutchess and Columbia counties—limonite.....	144,878	43,000
6. Staten Island—limonite.....	93,118	.....
7. Hudson River—carbonate ore.....	.....	112,000
Totals.....	1,262,127	1,266,000

pany, Detroit, Mich.; the Schiffler Bridge Company, of Pittsburgh, Pa., and the Phoenix Bridge Company, of Phoenixville, Pa.

**The Advance in German Wages.**

The settlement of the recent German strikes in favor of the workmen is causing an analysis of possible results to be made in many quarters, but notably by the English. Dr. Beumer, secretary of the northwestern group of the German Iron and Steel Trade Association, has issued a report showing the general effects of the recent strike of miners upon the iron and steel trades. According to Dr. Beumer the higher wages conceded to the miners have increased the cost of producing bars and girders by about 4/6 a ton, and of sheets and plates by about 7/4 per ton. Taking these figures as a basis of deductions, English writers allege that henceforth the German iron and steel industries, as well as the multifarious branches of trade which are connected therewith, will be less vigorous in their international competition. These new



THE ROBIE SCREW-JACK.

lever, or a ratchet attachment may be used. The operation is readily understood, the jack being placed under the weight and the power-nut turned by means of a lever or ratchet, causing the screw to be fed upward and the weight lifted. The power-nut remains stationary, so far as the vertical movement is concerned, and rotates upon the anti-friction rolls or balls. These jacks are manufactured by Riché Bros., of Philadelphia, Pa.

**Iron-Ore Production of New York.**

We have received a copy of the No. 7 Bulletin of the New York State Museum of Natural History. This number comprises the first report on the iron mines and iron districts in the State of New York by John C. Smock, of the Department of Mineralogy and Economic Geology and in charge of the New York State Museum. The report embraces 70 pages of historical, geological and statistical details relating to all the iron-ore mines of the State of New York. In connection with the report is furnished a map of the State showing the location of the iron-ore mines of 1888. This map is an exceedingly creditable piece of work, and by means of it the location of any iron-ore mine is seen at

The production of the State in 1888 by kinds was as follows:

Kinds of ore.	Gross tons.
Magnetite.....	926,000
Hematite.....	185,000
Limonite .....	43,000
Spathic ore or carbonate .....	112,000

Total ..... 1,266,000

Comparative Production of the United States and New York.

Years.	Gross tons.		Per cent-age.
	United States.	New York.	
United States census year 1869-70.....	3,210,918	470,491	14.00
United States census year 1879-80 .....	7,974,806	1,262,127	15.4
1886 .....	10,000,000	900,000	9.0
1887 .....	11,300,000	1,100,000	9.7
1888 .....	12,062,530	1,266,000	10.5

The rank of the State was third in 1880, falling behind Michigan and Pennsylvania. In 1888 it was fourth, Wisconsin having taken the third place.

A number of new iron bridges will be built this year by the Louisville and Nashville Railroad Company. Contracts have been given to the Louisville Bridge and Iron Company; the Detroit Bridge Com-

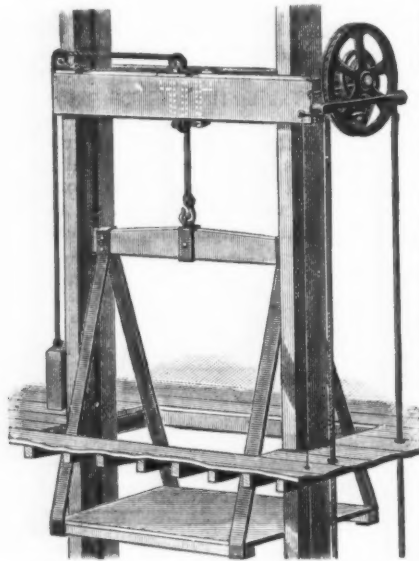
pany, Detroit, Mich.; the Schiffler Bridge Company, of Pittsburgh, Pa., and the Phoenix Bridge Company, of Phoenixville, Pa. burdens, they say, will bear heavily upon the iron and steel manufacturers of the Empire. In other of the German industries wages are being raised very generally under the pressure of agitations and strikes, and the one-third of the cost of the national insurance scheme will fall upon all employers of labor in an even and impartial manner. The hours of labor remain the same for the most part, but a reduction in that respect forms part of the programme of the strike agitation now being carried on. There is evidence that there is plenty of room for such a reduction, just as there is also room for the better housing and greater temperance of the workmen.

Whether all or any of these points will be gained by the agitators yet remains to be seen; but in any case there is no doubt whatever that the general cost of production is rising, and will continue to advance for some time to come. All changes in that direction must be to the advantage of those who have to compete with German products. And on this side of the Atlantic, as well as in England, the force of German competition has been felt by steel manufacturers particularly to an extent that causes them to feel deeply interested in the changes now impending in German industries.



### Elevator Gearing.

The engraving represents a new elevator gearing made especially for the handling of loads of from 500 to 1000 pounds. The hand-rope and counterbalance weight can be placed on any side of the platform. The hand-rope wheel is 30 inches in diameter, the rope being 1 inch. The load-rope is of the same size, although a single rope is used for the smaller size and two ropes for the larger. The top of the platform can be raised to within 3½ feet of the ceiling, so that a platform can be used where the ceilings are low. The shafts are made of steel and run in reamed boxes. The gearing is fitted with automatic



*Elevator Gearing.*

double-acting brake which sustains the platform at any point, so that in loading there is no danger of its lowering of itself. When lowering, the speed is controlled by brake. This machine is manufactured by the Energy Mfg. Company, of Philadelphia, Pa.

**Securing Cheaper Fuel at Pittsburgh.**—The movement among the iron and steel manufacturers of Pittsburgh to secure and control their supply of natural gas is spreading. This is caused by the fact that the natural gas companies are now asking, and have been asking for some time, more than double what was paid during the first year or so after the introduction of natural gas as fuel. Jones & Laughlins, Limited, and Oliver Brothers & Phillips have arranged to be supplied by the Monongahela Gas Company, in which both firms are large stockholders. Among other concerns which have their own gas lines may be mentioned Park Brothers & Co., Limited, of the Black Diamond Steel Works; William Clark's Son & Co.; Carbon Iron Company; Zug & Co., Limited; Mackintosh, Hemphill & Co., Limited, and the Union Iron Mills, of Carnegie, Phipps & Co., Limited. These concerns are being supplied with natural gas by the Pittsburgh Company, which is owned almost exclusively by the manufacturers themselves and by the Equitable Gas Company, in which they also own stock and which will be ready to supply a large number of new customers in a short time. It is believed that a majority of the manufacturers of that city will soon own their own gas lines and then be independent of the Philadelphia Company, who have had almost a monopoly of the gas business at Pittsburgh.

John Hughes, an iron-master and engineer who died recently in St. Petersburg, was one of the most remarkable English-

men who have occupied themselves with developing the vast resources of the Russian Empire. The deceased was principally known as the founder and director of the new Russian company in the town of Hughesofka, in South Russia. The iron and engineering works at Hughesofka are the largest in Russia, and on the spot where in 1860 there were only a few huts there now exists a large town with 15,000 inhabitants, thanks to the indomitable energy of Mr. Hughes. John Hughes was not only a clever engineer, but was also known as an inventor. While director and owner of some mechanical works in Newport, in South Wales, he invented the first coal-lift now used in the pits. At the time of his death he was engaged in a project for developing the immense coal and iron beds of South Russia. The deceased was born at Merthyr, in South Wales, and was 75 years of age.

### Important Tariff Decisions.

The Treasury Department has allowed the appeal of the importers on certain steel-plate shearings imported at Philadelphia, assessed at the rate of three-tenths of 1 cent per pound, but claimed by the importers to be dutiable at 45 per cent. ad valorem. The merchandise in question was found to consist of pieces of steel cut from boiler-plates in the process of manufacturing boiler-plates. The Department decided that the merchandise, being new, should be classified as "steel not specially enumerated or provided for." The Department has affirmed the decision of the Collector of Customs at New York in assessing duty at the rate of 45 per cent. ad valorem on certain so-called wire nettings, imported and claimed to be dutiable as such. The appraiser reports that the goods are what is known as "wire muzzles" for bottles, made of tinned wire, twisted into the form of dog muzzles, and used for holding corks in bottles, and being wholly of iron are assessed as such.

The action of the Collector of Customs at New York in assessing duty at the rate of 25 per cent. ad valorem and 20 per cent. additional duty on certain so-called watches has been approved. The merchandise consisted of watch movements of American manufacture which had been sent abroad for the purpose of having repeating attachments added to them. Duty was assessed on them because they were not returned in the same condition as exported.

The United States Board of Customs Appraisers, in session in New York, decided that the portable railway sections, composed of two small thin steel rails, 16 feet long, fastened or tied together by thin U-shaped rolled-iron sleepers of narrow gauge—about 24 inches—and so bolted and clamped as to make them a completed article, and so shipped from place of manufacture, were manufactures of iron and steel, dutiable at 45 per cent. ad valorem, in accordance with paragraph 216 of the indexed tariff.

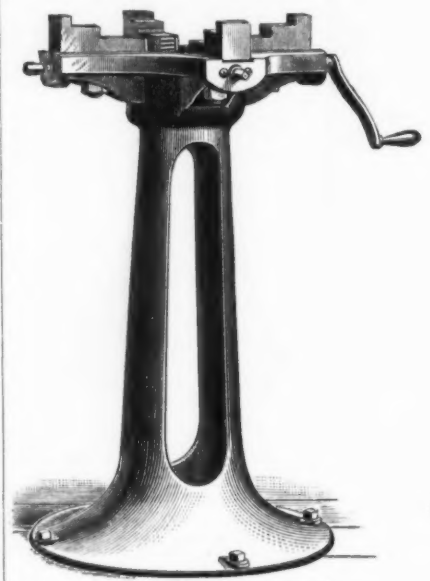
Secretary Windom has sent a circular letter to the collectors of customs at El Paso, Laredo and Eagle Pass, Texas, where all importations of lead ore from Mexico are made, instructing them with regard to the treatment of such ores under existing rules pending the settlement of the question now before the Treasury Department in regard to the proper classification of lead ores. It is stated at the Department that these instructions do not affect the main question at issue, which will not be decided until after the return to the city of Assistant Secretary Tichenor, who is expected about the end of the month. The following is an abstract of the instructions:

It appears that a practice has grown up of permitting in the same entry as the product of one mine the mingled products of several mines possessing different

characteristics, and that sampling is conducted in a very irregular manner by what is familiarly known as the "grab process." It is evident that neither of those methods is adapted to a proper execution of the provisions of the general law respecting importations of merchandise. Pending a further consideration of the question the sworn entry shall embrace, in addition to what is now required, a statement of the estimated quantities and values of silver and lead contained in the importation, according to the best knowledge and belief of the importer or consignee. The entry shall further contain a declaration that the importation embraces no mixture of ores or concentrates from different mines. Proper and adequate samples shall be taken in the manner approved and practiced by miners in the handling and reduction of ores by thoroughly mixing and quartering every tenth shovel or more, repeating the operation until the usual commercial sample be obtained.

### Hand Reaming-Machine.

The accompanying engraving represents a device for holding work to be either reamed or tapped out by hand. It can be set in any convenient place and bolted to the floor. The machine will hold work from 20 inches down to 1¼ inches in diameter. There is a hole in the center of the chuck 4 inches in diameter, so the reamer will go through the chuck and can be taken out of the side of the stand.



*Flather's Hand Reaming-Machine.*

The jaws of the chuck are large and strong and are made of steel castings. The screws are also made of steel. This machine is made by Hill, Clark & Co., of Boston, Mass.

The building of steel barges capable of carrying 100,000 bushels of grain at a load has become an important business on the lakes. At Duluth, on the 17th inst., the second vessel of this description for the American Steel Barge Company was launched and still another is far advanced toward completion. The new vessel is 253 feet keel length, 260 feet over all, 36.1 feet beam, and 18.66 feet molded depth. Her total depth is 22 feet and her net registered tonnage rating is 1138.56 tons. In her construction is used about 800 tons of mild steel, all from the works of Carnegie, Phipps & Co. As recently stated, the Illinois Steel Company, of Chicago, contemplate engaging extensively in the business of building steel vessels for employment in lake commerce.



## THE WEEK.

The fact that the Legislature of Missouri has passed a law intended to eliminate the business of dealing in futures in that State has attracted attention to this class of transactions anew. The law referred to makes it a criminal offense "to purchase or to pretend to purchase or sell certain commodities, on margin or otherwise, without intention of receiving and delivering the goods." It is explained that an agreement between the parties to deliver and to receive the goods specified does not divest the act of being an offense; it is not necessary, in order to constitute an offense, that both the buyer and seller shall agree to do any of the acts prohibited, but the offense shall be complete against any corporation, association, co-partnership or person thus pretending or offering to buy, whether the offer to sell or buy is accepted or not; and any corporation or agent who shall display in any manner any such offer to buy or sell, or any statements or quotations of the prices of any such property with a view to any such transactions, shall, for each offense, be deemed and held as an accessory, and upon conviction shall be fined the same as the principal.

Within the last year there has been a complete revolution in the character of the vessels engaged in the carrying trade at Philadelphia. Steamships which formerly carried 1800 tons of iron ore find themselves supplanted by better vessels carrying 4000 tons, while the coasting schooners which formerly controlled the coal trade, carrying 800 tons each, are giving way to the four-masters of 2800 tons capacity.

"It is difficult to estimate the amount of gold hoarded in India," says a writer in *Chambers's Journal*, "but it was approximated before the Royal Commission on Bi-metallism at £130,000,000, which was the amount imported during the last 50 years, and is exclusive of the hoards for centuries past. The silver was computed at about £170,000,000. This yields for both gold and silver a sum of £300,000,000, which represents nearly one-third of the value of the total amount of coin (£1,000,000,000) estimated by Dr. Soetbeer to be in circulation in the world. The form which the hoarding takes is that of bullion or coin, but frequently the metal is made into ornaments, partly used for the purposes of adornment and partly kept as a hoard."

The annual report of the Canadian Minister of Railways, recently issued, furnishes some interesting facts. In 1880 the total paid-up capital of the railways of Canada amounted to \$371,051,173 and in 1888 to \$727,181,448, an increase of 96 per cent. The increase in net earnings was only 76 per cent. Comparing 1880 with 1888, operating expenses increased from \$16,840,705 to \$30,652,046, or 82 per cent., while the gross earnings increased from \$23,361,447 to \$42,159,152, or 80 per cent. The total miles of railway completed increased from 7229 miles to 12,701, or 74 per cent., and the mileage run by trains from 22,427,449 to 37,391,206 miles, or 66 per cent.

About 700 men are now working on the Nicaragua Canal, under F. P. Davis, resident engineer, with the more immediate object of preparing for the use of steam-dredges and excavators. The erection of the machine-shops has commenced. The Costa Rican Minister at Washington disclaims on the part of his Government any feeling inimical to the success of the enterprise.

The Rossmore, the largest freight-carrying steamship on the Atlantic, the first of the new steamships for the Baltimore service of the Johnston line, is constructed

to carry 1225 cattle. Her dimensions are 413 feet in length, 46 feet 3 inches in breadth and 37 feet to spar deck. She has a weight-carrying capacity of 6800 tons, and her speed will be 12 knots per hour. Her engines will develop 2500 horse-power.

Another electric subway exploded on Friday evening in Broadway near Twenty-third street. At almost the same moment there was another slight explosion at the corresponding man-hole at Nineteenth street. This occurred despite the efforts to purify the subways by injecting fresh air. Subway Commissioner Jacob Hess says: "The gas companies' mains leak, and the gas collects in the man-holes. Then the man-holes blow up. I don't know how we can help it, except by forcing the gas companies to keep their gas in their own pipes. There is no form of man-hole that can be devised which will not fill with gas free in the ground. It will pass through brick, stone, mortar and even iron. In this case none of the wires in the subway were live."

The exploit of the Merritt Wrecking Company in removing the sunken iron steamship *Atlas* from the bottom of the North River was one of the most difficult which the company have yet undertaken. The steamer went down in mid-stream, from the effects of a collision with a Hoboken ferry-boat, which occurred last autumn. She had a full cargo of bananas, coffee and logwood. The *Atlas* weighed 1400 tons, and was sunk in 10 fathoms of water upon a scattering reef of rocks and boulders of varying size, from 2 to 14 feet high. Owing to the enormous dead weight of the vessel 16 chains 2½ inches thick, which are the largest ever employed for such a purpose, had to be used. It was with the greatest difficulty that these chains were placed under the *Atlas*, water-power being used to blow out a sufficient space below the keel to get them under. Even after this was successfully done the chains, resting on sharp rock, were cut through by the action of the keel upon them. Eight pontoons were employed, arranged on either side of the sunken hulk. These were made fast at low water and pumped out, and the lifting-power thus gained was re-enforced by the rising tide. After several futile endeavors the huge mass was lifted from its bed and moved several hundred feet. The slack chains were taken in at the first opportunity and the attempt repeated with entire success. The *Atlas* lies on the Hoboken flats, from whence she will be taken to the dry-docks.

The Commissioner of Patents has decided on final appeal a well-fought controversy involving the right to letters patent covering rolled cast-steel car-wheels. The contestants are the Fowler Steel Car Wheel Company, of Pittsburgh. The proofs showed that a long time after the Fowler steel car-wheels had been publicly produced in Pittsburgh the Pittsburgh Steel Casting Company began to produce car-wheels of a substantially similar character and by the same methods. The Pittsburgh company subsequently became the assignee of Clifton B. Beach, of Cleveland, Ohio, who had long before received certain letters patent pertaining to car-wheels of a different type, and who had, after assignment, filed an application for patent, professedly based upon a prior application of his, which for years had been a dead and abandoned application. The commissioner decided in favor of Fowler, the patentee, thereby affirming the decision of the Board of Examiners-in-Chief and the Examiner of Interferences. The commissioner in his decision says: "There is much in the case that tends to show that if Fowler had not made and perfected and tested the invention and dem-

onstrated its value Beach would never have attempted to revive his old claim and seek to secure a patent."

A secret circular having the signatures of T. V. Powderly, general master workman, and John W. Hayes, general secretary of the Knights of Labor; Samuel Gompers, president of the Federation of Labor; W. N. Sargent, chief of the Brotherhood of Locomotive Firemen, and others, has been issued, urging the formation of an alliance among those labor organizations with the object of solidifying their ranks and bringing within their membership every man and woman in America who works for a living. It is an open question as yet whether the rights of labor cannot be defended more advantageously through the medium of organizations directly representing the particular industry concerned, rather than through one so complex and cumbersome as that now proposed.

W. D. Collingwood, of Buffalo, has secured the contract for building the Cornell library building, his bid being \$200,000. Contracts for heating and lighting and constructing the stacks are yet to be let. These will make the total cost exceed \$225,000. The structure is to be the largest and most complete library in America.

A dispatch from Elk Horn, Wis., announces that John E. Burton, known as the Gogebic Iron King during the mining craze two years ago, has made an assignment. Gage E. Tarbell, of Milwaukee, is the assignee. The liabilities of Mr. Burton are stated to be about \$825,000, and the Central Trust Company, of New York, whose claim is \$350,000, is the largest creditor. The suit involving the legality and justice of this claim, which is disputed, is now pending before the Supreme Court. Mr. Burton says that he has been so harassed by creditors that he was forced to assign. He said to a reporter: "Nearly 100 suits have been brought against me in 18 months, and my credit ruined and property depreciated and slaughtered from \$2,200,000 to less than \$1,000,000, and in nearly all cases it was wholly unnecessary."

The application for the pardon of E. L. Harper, the iron manufacturer who became involved in the affairs of the Fidelity Bank, has been returned from Washington with an unfavorable recommendation.

The cast-iron-pipe foundries east of the Mississippi are so stocked with orders that it will take a long time to fill all contracts. New York, Washington and Newark, N. J., are now receiving large supplies of the larger sizes of water-mains, besides smaller cities. At Albany on Tuesday bids were to have been opened for 4000 tons of 42-inch pipe. Three firms were represented: The McNeal Pipe and Foundry Company, of Burlington, N. J., R. D. Wood & Co., of Camden, N. J., and the Gloucester Iron Works, of New Jersey and Philadelphia. Notwithstanding that the three were present, but one bid was filed, that of the McNeal Company. They offered the pipe at \$28.90 a ton and the special castings at \$60 a ton. The Water Commissioners did not say they thought there was a "combine," but indicated that such was the case. The special castings were about double the price paid for the last. The bid was rejected and new proposals will be invited. Brooklyn's Common Council has provided for the ordering of 22,000 tons of 42-inch pipe and this order will have to be placed shortly.

The chemical works of Dodge & Olcott, in Jersey City, were burnt on Saturday. Their loss is estimated at \$120,000 on building and machinery and \$200,000 on essential oils and other stock.

## MANUFACTURING.

### Iron and Steel.

The Columbia Iron and Steel Company, of Uniontown, Pa., have asked their employees to accept a reduction in wages sufficient to cover the cost of freight on steel billets from Uniontown to Pittsburgh. The employees claim this is not just, as the firm have advantages which equalize cost in comparison with their competitors.

Bessemer, Ala., has captured the Henderson steel plant, and work has been begun on the chosen site. G. W. Gogin and E. C. Robinson, prominent and experienced steel men from Boston, are superintending the construction of the plant. The products will be principally soft tank-plate and basic open-hearth steel, but tack-plate and horseshoe-nail-plate will also be made.

Keasler & Vicker are reported by the *Chattanooga Tradesman* to be building a small pig-iron furnace at Hughes Springs, near Jefferson, Texas. It will be completed in about four weeks, and will have a capacity of about 5 tons a day; although small, if it proves profitable it will be immediately enlarged. In connection with the furnace the proprietors are erecting a foundry for the purpose of manufacturing plows, &c.

The Talladega (Ala.) Steel and Iron Company are receiving ore and other materials preparatory to putting in blast the furnace of the company at that place.

The Vulcan Forge and Iron Works of Long & Co., at Chartiers, near Pittsburgh, which has been closed down for some time undergoing repairs, has resumed operations with a full force of 260 men. This plant has only been closed two weeks per year for five years, and then only for repairs. The firm have never had trouble with their workmen, any dissatisfaction always being promptly and amicably settled.

The property of the Nashville Iron, Steel and Charcoal Company, in West Nashville, Tenn., has been sold by R. L. Morris, assignee, in pursuance of a deed of trust which was made January 22 of this year. The plant has been in operation since the assignment by the assignee with a degree of demonstrated success that is thought to have influenced the sale in a favorable manner. The sale was made subject to all liens, amounting in the aggregate to \$180,000, made up of first-mortgage bonds, \$100,000; second-mortgage bonds, \$50,000, and mechanics' liens and accrued interest. Dr. William Morrow, of Nashville, and a local syndicate represented by H. W. Buttorff were the principal bidders. It was finally knocked off to the Buttorff syndicate at \$11,000, plus the prior liens. The syndicate will operate the plant and are prepared to begin at once, the furnace having been banked by the assignee at their request, preparatory to resuming operations. The plant cost \$319,000, which does not include the equipment account and the boats and barges. Nearly \$400,000 was spent by the originators. The Nashville Furnace Company have already been organized to operate the works. The incorporators are J. Ellis, H. W. Buttorff, W. M. Pollard, J. H. Moore and J. M. Head.

Shoenberger & Co., proprietors of the Juniata Iron and Steel Works, at Pittsburgh, have not yet signed the Amalgamated scale, as the plant of the firm is still undergoing repairs and will not be ready for operations for some time. It is probable that this firm will ask for a sliding scale for three years, similar to that now in operation at the Homestead Steel Works of Carnegie, Phipps & Co., Limited. In conjunction with their iron and

steel plant this firm have a nail factory with a capacity of 250,000 kegs per annum. They manufacture chisel-pointed nails exclusively, but did not make a pound of nails all of last year. The last year's Amalgamated-Association scale provided that for chisel-pointed nails 25 per cent. more should be paid than for common nails, and for certain kinds 40 per cent. should be added. The firm signed the scale, but when they did so told the men that not a single wheel in the factory would run during the year. The firm want to start the nail factory, and will probably do so, as the nail scale this year puts them on exactly the same footing that other manufacturers are. They are also putting in an experimental plant to make steel by running the metal direct from the blast-furnace to the steel-converter.

The annual meeting of the stockholders of the Scottsdale Iron and Steel Company, Limited, was held in the office of the company, at Scottsdale, Pa., on the 15th inst., at which the following board of managers was elected: Peter S. Loucks, chairman; Jos. R. Stauffer, treasurer; Clark Grazier, secretary; W. N. Taylor, of Pittsburgh; Peter Campbell and A. H. Herbert, of Scottsdale, and A. S. Liven-good, of Everson.

The different departments of the Reading Iron Works, at Reading, Pa., are now being put in first-class working order preparatory to resumption on or about August 1. At the tube-works a number of machinists have been put to work repairing some of the machinery. A number of men are also engaged in repairing the furnaces. A singular fact is that of the 1600 or more men who have called at the office for work but few are puddlers and heaters.

The American Tube and Iron Company, of Middletown, Pa., and Youngstown, Ohio, have been awarded the lion's share of the Toledo pipe line. The company were awarded such a favorable share of the contract on account of the merits of their patent joint for natural-gas lines, which is known as the Matheson joint.

The work of dismantling the rolling-mill plant of the Ohio Valley Iron Company, at Moundsville, W. Va., prior to its removal and re-erection at Iron Gate, Va., has already commenced. Marked improvements will be made, not only in arranging the location of the rolls and furnaces in order to secure greater economy of labor, but also in the machinery. Additional boiler-power will be supplied, and such improvements made as will make the mill practically a new works. The Iron Gate Rolling Mill Company is the name of the new organization that is erecting it.

At a meeting of the Board of Directors of the Belmont Nail Company, held in the office of the company, in Wheeling, W. Va., on the 16th inst., a dividend of 3 per cent. out of the earnings of the last six months was declared.

We are informed that the report that Singer, Nimick & Co., Limited, of Pittsburgh, were about to make a reduction of 10 per cent. in the wages of their employees is without foundation. Such a step is not in contemplation at present.

The Ewald Iron Company, of Louisville, Ky., have increased the capacity of their works by adding facilities for rolling open-hearth and other soft-steel plates to meet the growing demand for plates of steel.

L. H. Smith, superintendent of the Gautier steel department of the Cambria Iron Company, at Johnstown, Pa., was a visitor to Pittsburgh last week. Mr. Smith states that his company will put up

temporary sheds over their machinery until more substantial buildings can be erected and that the works will be in operation by the last of August or the first week in September. The plant will not be removed from the site where it stood previous to the flood.

The latest estimate of the damage of the Cambria Iron Company by the flood, the *Philadelphia Press* says, is most reassuring. It is said that the main body of the works is hardly injured at all, that the Gautier steel works will be in operation at an early day and that a large amount of material which had been thought destroyed has been discovered in the *débris* and will be saved.

The Locust Grove Charcoal Furnace, at Rossville, Baltimore County, Md., has been dismantled. It was very small, 7½ x 30 feet, and was built in 1849.

The Falling Spring Charcoal Furnace, at Chambersburg, Pa., which has been idle since 1883, has resumed operations.

The contract for the steel tubes for the United States steel cruiser *Maine*, which is the largest armored vessel now being built by the Government, has been awarded to the Tyler Steel Tube Company, of Boston. The contract calls for about 50,000 feet of steel tubing.

Three puddling-furnaces and a heating-furnace, equipped with Levi D. York's patent gas-making device, are in successful operation at the Burgess Steel and Iron Works, at Portsmouth, Ohio. It is claimed that with this device there is no waste of fuel, all the products of combustion being completely utilized, while but a small quantity of coal is needed to operate it. Two more furnaces of the same kind are now being constructed. Mr. York is superintendent of the works.

The Bookwalter Steel and Iron Company, 18 Cortlandt street, New York, owners of the Robert process for the manufacture of steel, have been advised that their exhibit in the Paris Exposition was awarded the highest gold medal and 14,000 francs. John Brown & Co., of Sheffield, have taken a license from the English company controlling the patents for that country and are setting up a plant. The Michigan Steel Works, at Detroit, are now in operation under this process, and are said to be meeting with success.

Gordon, Stroebe & Laureau, Limited, of Philadelphia, have closed a contract for two 16 x 60 feet Gordon-Whitwell-Cowper fire-brick hot-blast stoves to be erected at Trondale Furnace, West Virginia.

### Machinery.

The Safety Light and Power Company, of New York, have contracted with the Westinghouse Electric Company, of Pittsburgh, for an electric-light plant of 15,000 incandescent lamps.

The Dueber Watch Case Works, at Canton, Ohio, are at last completed. Three years were occupied in erecting the buildings. The works employ 3000 men.

The Pennsylvania Railroad Company are having 90 new locomotives built at their various shops and at the Baldwin Locomotive Works, at Philadelphia.

The Racine Hardware Mfg. Company, Racine, Wis., are meeting with great success in introducing their electric-light engines and crude-oil burners. M. C. Armour is general manager of this department and the growing requirements of the business have caused him to establish his headquarters in Chicago. Agencies have been established in St. Louis under the direction of Moses P. Johnson for their combination oil-burning boiler and engine, and Ripley & Johnson for their crude-oil burners. Thomas J. Bell



& Co., Cincinnati, and Barboraux & Co., Louisville, have been appointed agents for their entire line of engines, boilers and burners. The company are putting in the electric-light plant for a new hotel in Hyde Park, Chicago, and have sold another outfit to the Edison Company in this city.

The Allentown Foundry and Machine Company, of Allentown, Pa., have received a contract to build a 50 horse-power engine for the Allentown Hardware Company, at Allentown, Pa.

The Blakeslee Mfg. Company, Du Quoin, Ill., last month placed one of their No. 6A steam-pumps in a mine at Roanoke, Ill. The suction-pipe is 800 feet long; steam-pipe, 700 feet long; discharge-pipe, 650 feet, with an elevation of about 500 feet. The pump works without shock or jar.

The Pennsylvania Railroad Company have placed the order for bolt-cutters, tappers, &c., required in their new locomotive shops at Altoona with the National Machinery Company, Tiffin, Ohio. The decision of the railroad company speaks well for the National. We understand they are now publishing a new and full catalogue of their specialty—bolt and nut machinery.

Messrs. F. E. Myers & Bro., manufacturers of force and lift pumps, hay-carriers, hay-forks, &c., at Ashland, Ohio, have completed their new works, and now have a large and very conveniently arranged plant. They have recently put in Teetor's milling-machines, and are confident that they have one of the best-equipped works in the country for the line of goods which they manufacture.

The Jeffrey Mfg. Company, of Columbus, Ohio, manufacturers of chain elevating-machinery, report that trade has been very active for the past month. They have orders from various parts of the country, and have just shipped several outfits to Japan and South America.

The Lidgerwood Mfg. Company have enlarged their principal office, located at 96 Liberty street, New York, which will enable them to handle more readily their large and growing business in hoisting machinery and appliances. The company have also just opened a new branch in Boston, at Nos. 197 to 203 Congress street, which will have one of the finest machinery stores to be found in the East. It will be in charge of J. H. Houghton, who will also represent the Gorton & Lidgerwood Company, makers of the Gorton House-Heating Steam-Boiler. Mr. Houghton is well known throughout the East by previous important business connections in the machinery line. Moses P. Johnson, 717 North Second street, St. Louis, is the newly accredited representative in that city of the Lidgerwood Mfg. Company.

The Ball Engine Company, of Erie, Pa., manufacturers of the Ball High-Speed Automatic Cut-off Engine, are making considerable additions to their capacity, adding both machinery and new buildings. Although the works have been running night and day for the past ten months the company have hardly been able to keep up with their orders, and present increase is absolutely a necessity. It will give an idea of the demand for this engine when we mention the fact that the company have orders for 7165 horse-power of engines to build for electric companies. In addition to their standard engines, they are now bringing out a line of compound engines, both tandem and double-horizontal, in capacity from 30 to 300 horse-power. The company have just completed the first of the 12 300 horse-power compound engines for the Edison Electric Illuminating Company, of Brooklyn, and the tests made at the factory were very satisfactory. The

first two engines for this large plant will be shipped in a few days, and when placed on their foundations an exhaustive test will be made.

The Foss Mfg. Company, of Springfield, Ohio, owning 5 acres of ground in East Springfield, on the line of the Ohio Southern Railroad, have decided to remove their present plant into a new building which is now in course of erection. The new structure will be of brick, four stories in height, 230 feet long by 60 feet wide, and is to be completed by November 1. A warehouse and foundry will also be erected.

#### Hardware.

The Universal Horseshoe Company, of New York, who have had one of their machines on exhibition at the Lookout Rolling Mill, Chattanooga, for the past few months, have secured a 5-acre tract of land on the McFarland estate, at Rossville, Tenn., and the establishment of the manufactory there is assured. About \$75,000 will be at once put into machinery and buildings. The main building will be 75 x 175 feet in size, and other buildings for storage purposes will also be put up. On the premises the company will erect 35 houses for the accommodation of families of their employees. The machinery for the Horseshoe Company is nearly all built at Pittsburgh, Pa., ready to be forwarded.

Hoopes & Townsend, manufacturers of bolts, nuts, washers, rivets, &c., at Philadelphia, have purchased the entire plant of the Hare & Morgan Company, of Wilmington, Del., and will operate it under the name of the Hoopes & Townsend Company as an addition to their Philadelphia works. They hope to make it a valuable adjunct to their productive capacity.

#### Miscellaneous.

Negotiations which have been in progress for some time have resulted in the Brier Hill Iron and Coal Company, the Struthers Furnace Company and Robert McCurdy, all of Youngstown, disposing of their interests in the Youngstown Coke Company to the Schoonmaker Coke Company, of Pittsburgh. The Mahoning Valley Iron Company, of Youngstown, still retain their one-fourth interest in the company.

In our issue of last week, in making mention of the sale of the entire property of the Connellsville Coke and Iron Company to the H. C. Frick Coke Company, of Pittsburgh, some errors crept in which we desire to correct. The statement was made that the H. C. Frick Coke Company before the purchase owned about 7000 acres of coal lands, when the truth of the matter is the firm owned in the neighborhood of 15,000 acres. We also stated that after August 1 the office of the Connellsville Coke and Iron Company would be removed to the office of the H. C. Frick Coke Company, at No. 48 Fifth avenue, Pittsburgh. The statement should have read that the office would be abandoned, instead of removed, as the Connellsville Coke and Iron Company will cease to exist after August 1 next. The office of the H. C. Frick Coke Company is at No. 104 Fifth avenue, instead of No. 48, as was printed. We are advised that last week the H. C. Frick Coke Company secured the new Helen plant of the McClure Coke Company, giving in exchange 75 acres of valuable coal land adjoining the Painter plant of the McClure Company. By the purchase of the Helen owns the H. C. Frick Coke Company will be enabled to join three of their plants.

The Coe Brass Mfg. Company, of Torrington, Conn., have determined to add to their line of products the manufacture of seamless and brazed tubing, both in

brass and copper. It has been found necessary in entering upon this branch of business to make an important extension to their works. The mill, when completed, will be as large a plant for the manufacture of tubes as now exists in this country. The work of construction has been energetically started and it will be pushed as rapidly as possible. The company will be prepared at first to manufacture tubes up to 8 inches in diameter.

The Michigan Stove Company, of Detroit, Chicago and Buffalo, have issued a number of illustrated sheets intended to be used as a supplement to their large and very handsome stove catalogue which was issued last season. These sheets are quite large, and show very handsome designs in stoves, embracing quite a number of new features.

We have received from the Jackson Architectural Iron Works, 315 East Twenty-eighth street, New York, a very handsome photograph of the Washington Bridge, recently erected over the Harlem River, in this city. The ornamental iron and bronze work of this bridge was executed by this firm. There are six views in all, showing the bridge in its entirety as well as some special sections of it, and they are handsomely mounted on a stiff card-board, with a wire attached to the back forming an easel.

A. J. Phillips & Sons, Fenton, Mich., manufacturers of Window-Screens and Snow-Shovels, are shut down for a few days making alterations and adding new machinery. The past season is referred to as having been the most successful in the history of the company and the outlook is regarded as very promising. They have just completed an especially fine office.

L. C. Gleason, Fenton, Mich., whose Handle factory was burned last winter, advises us that he has now a well-equipped factory in operation and is filling orders. He makes a specialty of Axe Handles.

Cordley & Hayes, 173 and 175 Duane street, New York, have received from the Pennsylvania Railroad a large order for their Indurated Fiber Fire-Extinguishers, and it is expected that on the Erie Railroad system and two or three leading lines these Extinguishers will be used.

Vaughan & Bushnell Mfg. Company, Chicago, have recently been filling some very large orders for their goods from Messrs. Dunham, Carrigan & Hayden Company, San Francisco; carload of Anvil Tools and Blacksmith's Forges, and carloads embracing the above articles with others to St. Louis and other points East and West.

F. E. Myers & Bro., Ashland, Ohio, advise us that the past season has been one of the most successful in their experience, the demand and output of Hay Tools being at least one-third heavier than ever before. They have been compelled to increase their foundry, core and oven capacity, and advise us that they are now building Myers' Pumps at the rate of 20,000 annually.

The Reliance Wire Works, Milwaukee, Wis., have purchased the Wire-Work plant of the Michigan Wire and Iron Works, of Detroit, Mich., together with the good-will of the business. This plant comprises presses, punches, forms and tools for forming and shaping work, made especially for this purpose by the former E. T. Barnum Wire and Iron Works, and is referred to as exceptionally cheap. With the addition of this machinery to their former outfit, the Reliance Wire Works Company refer to their unsurpassed facilities for turning out work both cheaply and in a superior manner.

An 8-inch artesian well in the suburbs of St. Augustine, Fla., has a flow exceeding 8000 gallons of water per minute.



# The Iron Age

New York, Thursday, July 25, 1889.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, JR., - EDITOR.  
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.  
JOHN S. KING, - - - BUSINESS MANAGER.

Elsewhere we present a summary of the statistics of the production of pig-iron in the United States in the first half of 1889 which have just been issued by the American Iron and Steel Association. The report of the association comes to hand too late for extended notice this week. We can only call attention to the remarkable fact shown by these figures that in the past six months the production of pig-iron in this country was larger than in any preceding six months in the history of the American iron trade. This will surprise those who have not kept close watch of the figures of active blast-furnace capacity presented in our monthly reports.

## The Proposed Exposition in 1892.

A meeting of representative citizens of New York is being held to-day for the purpose of discussing the advisability of undertaking a world's fair in 1892. Public sentiment is so strongly in favor of the adoption of this method for the proper celebration of the four hundredth anniversary of the discovery of America that it will be remarkable if any serious opposition to the scheme should develop. In issuing invitations to the conference Mayor Grant very wisely included not only citizens of great wealth and managers of vast business enterprises, but representatives of workingmen, officers of civic societies, statesmen, editors, and presidents of commercial bodies. The various vocations and industries of the city are well represented in the list. If they are to any extent imbued with the spirit which pervades the city at large they will speedily decide in favor of holding the proposed international exposition and will enthusiastically arrange for the preliminary work.

Without disparagement to the claims of any other city of the country as a suitable place for the celebration of the discovery of America, New York is in every way pre-eminently fitted to undertake the task of conducting the commemorative exposition, except in the matter of geographical location. But even this is not a serious objection, with our highly-developed means of communication. New York possesses so many other attractions of perennial interest that a very large part of the population of the country who have never visited the city would hail with pleasure the opportunity of seeing it which the cheap railroad fares usual upon such occasions would give them. But granting that the exhibition will be held in New York, it must be borne in mind that there is nothing in any way local about the celebration. The East and the West, the North and the South, are all equally interested in it, and the preparations should be so conducted as to enlist the active co-operation of every section of the United States. New York is

simply a site selected because of its industrial importance, its wealth, its large neighboring population, and the fact that it is on the main avenue of trade between the New and the Old World. The necessity of nationalizing the scheme cannot be overestimated, and is a point that should be emphasized from the very beginning. Since the centennial celebration at Philadelphia 13 years ago there have been many exhibitions throughout the country, but none of them were held in commemoration of a great event, and though eminently successful in many cases, they did not pretend to more than State or at most sectional significance. It is to be feared that these local shows may have given the impression that exhibitions hereafter are to be of a similar nature, and if this idea prevails there is danger that sectional jealousy may interfere with giving national support to New York City. It depends upon the preliminary steps, in just measure, whether or not the country at large is disabused of this notion and brought to a realization of the fact that every State and Territory is equally interested in making the exhibition a grand success. The way in which the centennial of Washington's inauguration was celebrated in this city but a few months ago proves that the people of New York may be intrusted to commemorate an event of the broadest interest, and it is not a boast, but simply stating an acknowledged fact, to say that New York is cosmopolitan above any other city of the country.

But though every State must take part in the event to make the celebration the success it ought to be, the chief share in the responsibility and burden will, in the nature of things, fall upon New York. Blind dependence upon local pride will not bring the wished-for result, but the people hereabouts must be persuaded that the proposed exhibition will be to their material benefit, and there ought to be no difficulty in convincing them of this fact. Instancing the Paris Exposition now in progress, there is no doubt but that the Parisians, as a whole, are already more than recompensed for their contributions. The inflow of money upon such an occasion is simply enormous, and if it were only possible to discount it in advance there would be no need of asking for assistance. The direct profit to the business portion of the community is, however, not to be compared to the indirect benefits that result to the city and country in which an international exhibition is held. It promotes trade, encourages manufactures, stimulates invention, and in a host of other ways adds to the national prosperity.

In comparing the probable conditions in New York in 1892 with the actual conditions in Philadelphia in 1876 we discover the most satisfactory evidence for a successful issue of this venture. Philadelphia at the earlier date had a population of 800,000, while New York and its environs will in three years' time probably include a population of nearly 3,000,000; the assessed valuations considered in like manner are \$524,000,000, compared with \$1,700,000,000. In comparing New York State with Pennsylvania a similar advantage is noticed. The contribution of Philadelphia in 1876 was \$500,000 and of Pennsylvania \$1,000,000. Contribu-

tions from New York City and State figured on the same basis of percentage would give a total of \$4,000,000. The United States between 1876 and 1888 increased in population from 35,000,000 to at least 60,000,000, and the estimated value of property from \$44,000,000,000 to \$55,000,000,000. These general figures of wealth and population, State and National, will serve to indicate how excellently well prepared the country is to inaugurate and carry through to success the greatest exhibition of the age. Everything depends upon proper organization and efficient management; but on the very day of the preliminary meeting it is impossible to make definite statements or even probable forecasts.

## A Few Points on the Export Trade.

A remarkably entertaining article on American exports of cutlery was some time since published by one of our contemporaries, under the very captivating head, "Why America is Taking England's Cutlery Trade." The statements made with regard to our foreign trade were so very extravagant, although so entertaining, that the article was considered by us unworthy of reproduction. Since then, however, we have observed it reappearing in several quarters, even finding a place in the columns of journals which have a reputation for correctness. Under the circumstances, therefore, it seems necessary to throw some light on this subject. The opening paragraph of the article in question is as follows:

There are few people not connected with the steel business who know how deeply we are cutting into the English trade in fine cutlery, but the fact is that the markets that formerly took English cutlery exclusively six or eight years ago are now buying the output of American factories almost, if not quite, as freely as they invest in those from Sheffield, and our sales are increasing steadily, while those of the English firms are steadily dropping off. Sheffield for generations has had a practical monopoly of this trade, but now Massachusetts, Rhode Island and Connecticut almost equal the famous steel center when countries not under British rule are considered, and if once the prestige of the Sheffield steel could be overcome we would drive them out of the export trade, for they are now relying on their name far more than on the excellence of their product.

The above would leave the impression that the American manufacturers of cutlery were doing an enormous trade in foreign markets where English cutlery has always ruled supreme. This is far from being correct. We are informed on the authority of large exporters that our people are sending some goods to South America, West Indies, China and Japan, but in very limited quantities, while the English really control the business. We make very good cutlery in this country, but it would be stretching the truth to claim that it is better than that made in England. Any one in a position to know the extent of English trade with all markets of the world would hardly be guilty of the statement that Massachusetts, Rhode Island and Connecticut almost equal the famous steel center, Sheffield, even outside of countries under British rule. But the richness of this extract is surpassed by the following:

One of the most marked instances of this was in the Australian axe and hatchet market. The trees of that country are peculiar, the

wood being generally soft but remarkably gummy and tenacious. The ordinary axe with sharp corners is very likely to stick in this wood, and the labor of taking it out is greater than that required to make the stroke. An enterprising American noticed this and sent out a consignment of round-cornered axes. They sold very rapidly and were pronounced far superior to the ordinary shape. Several large dealers sent word to Sheffield that the new model was the best, and asked that the English send out axes adapted to the Australian trade. This they declined to do, as their workmen were accustomed to the old form. The consequence has been that the American axes are now used all over Australia and New Zealand. The same experience was met with in regard to hatchets. The Australian bush is thick and a great deal of clearing is necessary. The hatchet with the cutting edge parallel to the handle was found inconvenient, and again an American firm came to the front with a small hatchet shaped like an adze—that is, with the edge at right angles to the handle. For chopping down bushes this was far more effective than the regular hatchet, but for the second time the English manufacturers refused to alter their modes of manufacture, would not make adze heads of a small size, and the United States has all this trade.

We should like to know who the enterprising American was who sent a consignment of round-cornered axes to Australia, also the manufacturer who makes a hatchet for that market with the edge at right angles to the handle. In the first place, it is not the round-cornered axes which have the preference, but, on the contrary, the square-cornered or nearly square. The best-selling axe for that market is the Maine pattern. The English have imitated the American goods to the best of their ability, and it is not through lack of enterprise that they are giving us some of their business.

The next extract will probably bring a smile to the faces of steel manufacturers. It is as follows:

The trouble with the Sheffield cutlery men is that they have set three or four standards of hardness and refuse to vary them. The Americans, on the other hand, recognize the fact that hard steel, under certain conditions, is not nearly as useful as an inferior grade. Hard steel keeps its edge better, but without proper appliances is much more difficult to sharpen than that of a softer consistency. This may seem a small matter, but it has cost Sheffield manufacturers nearly all the Mexican and South American trade and a greater portion of that of India and Australia. . . . In Massachusetts there is a certain quality of steel, soft and easily sharpened, which is used almost exclusively for making implements for out-of-the-way localities, and in the mowers and reapers a second set of knives for the cutting-bars forms a part of the equipment. The English, although the condition of affairs has often been brought to their attention, will not adopt this style of steel, calling it shoddy. Their obstinacy must cost them from \$30,000,000 to \$50,000,000 a year.

It would be very interesting to know in what part of Massachusetts this special quality of steel is made. Its properties are truly very remarkable. We are no doubt increasing our general export business, and will eventually have a generous share of the world's trade, but we are now in our infancy in this respect and must not imagine that we are full-grown. No quicker way to awaken us from such a dream as this can be devised than to turn to the reports of the Bureau of Statistics and learn the cold facts. In the 11 months ended May 31, 1889, our exports of cutlery to all countries amounted to only \$92,935, against \$107,390 in the corresponding period of the previous fiscal year. Some cutlery may have been in-

cluded among saws and tools, but in the respective periods mentioned their exports amounted to but \$1,781,523 and \$1,486,879. Where are the millions which figured so vividly in the imagination of the gifted exponent of the export trade above quoted?

#### The Salt Combination.

The long-talked-of Salt Trust has materialized in the shape of a company incorporated under the laws of the State of New York, with a capital of \$11,000,000, on which the State tax, which was paid, amounted to \$13,750. Wellington R. Burt, president of the Michigan Salt Association, is president; Franklin Woodruff, of New York, vice-president, and H. K. Thurber, also of New York, treasurer. The trustees comprise prominent gentlemen in this country and England. The object of the company, as stated by their prospectus, is to unify and systematize the salt interests of the United States and Canada by acquiring and operating the principal works. In order to pay outright for the properties, which embrace nearly all the salt-producing properties on the North American continent, and to furnish capital with which to do the business, the amount of money required is \$15,000,000. The organization is similar to the English Salt Union, in harmony with which this enterprise is promoted, and which, although in operation but six months, has declared a dividend at the rate of 10 per cent. The properties under option to the company now and which it is intended to acquire embrace 130 different works and properties, producing about seven-eighths of the annual production of salt on the North American continent.

It does not appear that the incorporators are deterred in their purpose by the several decisions of the courts directed against combinations of this general character. In the case of *Clancy vs. the Onondaga Fine Salt Company*, in this State, the court decided that "the purposes which were attempted to be accomplished through the corporation were illegal. The end to be attained being illegal, the contracts and agreements entered into to secure the end must be equally so." The highest court in Ohio also decided in relation to a similar combination of salt-makers in that State as follows:

Public policy unquestionably favors competition in trade, to the end that its commodities may be afforded to the consumer as cheaply as possible, and is opposed to monopolies, which tend to advance market prices, to the injury of the general public. . . . The clear tendency of such an agreement is to establish a monopoly and to destroy competition in trade, and for that reason, on grounds of public policy, courts will not aid in its enforcement. It is no answer to say that competition in the salt trade was not in fact destroyed, or that the price of the commodity was not unreasonably advanced. Courts will not stop to inquire as to the degree of injury inflicted on the public; it is enough to know that the inevitable tendency of such contracts is injurious to the public.

The new corporation will be known as the North American Salt Company. Like the Sugar Trust, it will endeavor to limit production and to make prices remunerative to the manufacturers controlling the stock. The scheme is magnificent in its proportions and for audacity of purpose has rarely been paralleled. The principal

difficulty to be overcome is presented in the legal impediments. Aside from all other questions, it does not readily appear how properties which, in the aggregate, have yielded only a meager margin of profit can suddenly pay 20 per cent. on an enormously inflated capital, and this, too, while some of them are closed up and carried at a dead loss. This is one of the tricks that confound the honest man and of which the public will know more by and by.

#### Late Developments in Peru.

As the ratification of the Grace contract by the Peruvian Congress will place Peru once more in a position to recover from the losses entailed by the war with Chili, it is, from a general commercial point of view, important to examine the elements which that country will have at its disposal to work out its salvation. The treaty of peace between Chili and Peru was signed at Ancon, October 20, 1883. No sooner was the Chilean army of occupation withdrawn than Peru at once fell into revolution and anarchy, from which it was rescued by the present incumbent of the presidential chair, General Andres Anelino Caceres, who assumed the duties of his office June 3, 1886. Since then the country has been quiet, but in consequence of the utter impoverishment of the people at large it has been up-hill work to restore some degree of prosperity to Peru, in spite of its magnificent natural resources. On July 6, 1886, Peru owed a foreign debt of \$252,115,940, a domestic bonded debt of \$27,800,000, and had in circulation \$88,541,000 of irredeemable paper money, constituting a total national indebtedness of \$368,456,940. As the nation, however, owned rich silver mines, valuable public lands and well-located railroads partially in operation, it was evident that some arrangement with its foreign bondholders would be possible, enabling the republic to resume gradually its position as a prosperous South American State.

The firm of ex-Mayor Grace, in New York, Messrs. W. R. Grace & Co., deserve credit for suggesting a plan of settlement. Michael P. Grace, a member of the firm, went to Peru and submitted his plan, but when the latter was published Chili objected to certain clauses in it implying its responsibility toward the bondholders for part of the Peruvian debt. Chili protested and pointed to the clauses of the treaty of Ancon. The Grace plan of settlement had consequently to be thoroughly modified. While these changes were being made Lord Donoughmore, member of the British House of Lords, went to Peru in August, 1888, as the representative with full power of the English holders of Peruvian bonds. The capital which they have tied up is about £54,000,000, and that gentleman and M. P. Grace have since been hard at work trying to settle the debt on the basis of the modified Tyler-Grace contract of May, 1887. According to the contract the English bondholders will surrender their bonds and so cancel the external indebtedness of Peru. Peru in return gives her national railways, grants of agricultural land and certain mines. The bondholders agree to complete the railroads and maintain them in perpetuity. The syndicate will be allowed to mortgage its property up to \$30,000,-



000. The railroads are expected to yield \$400,000 a year. The scheme is highly popular in Peru, being the only one capable of regenerating the country, and President Caceres energetically advocates its adoption. It has been submitted for ratification to the Peruvian Congress several times, but in each instance rejected for reasons difficult to discover, probably chiefly political. But the President has perseveringly resubmitted it every time, and at length is about to gain his point, according to the most recent advices. The first seven clauses of the contract have finally been approved by the Chamber of Deputies, and it is believed that the acceptance of the remaining articles and of the entire contract is assured.

Prior to the war on the Pacific, when the guano deposits of the Chinchas Islands were not yet exhausted and Peru without difficulty floated its loans in London, Henry Meiggs and other Americans largely entered into railroad construction in that country, and the famous Oroya railway between Lima and the Cerro de Pasco silver mines was built, as well as others; consequently a settlement of the Peruvian debt is likely to be followed again by American undertakings of the kind, because the condition of the country will then once more inspire confidence. Our trade with Peru will also revive from its present comparatively insignificant proportions. Peru is capable of producing annually 60,000 to 100,000 tons of sugar. It has done so in times gone by, but during the revolutions the machinery was partially destroyed, and the impoverished planters had neither money nor credit to replace it by new and improved machinery. All this will change, the more so as sugar has improved 50 per cent., and sugar-planting has become a remunerative industry once more. Many American articles will be required, from agricultural implements down to carriages and provisions, &c. Our domestic export to Peru last year did not exceed \$752,301, against \$829,154 in 1887; it is susceptible of a considerable increase from the moment credit is restored and money once more pours freely into the country, whose population does not much fall short of 3,000,000.

The Canadian Government is decidedly in earnest in its determination to open up communication by Canadian lines of steamships with other ports of the world. A contract for a new Atlantic mail service was signed at Ottawa on the 16th inst. with the Messrs. Anderson, of London. The firm will begin at once to build four steamers, and they expect to enter upon the weekly service in about 18 months. The contract calls for fleet steamers of 20 knots, capable of doing the journey between the terminal points, Quebec and Plymouth, in six days. Each vessel is to be of large size, 6000 tons, and Halifax will be the terminal in winter and Quebec in summer. It is understood that the Messrs. Anderson are also to undertake a service between Vancouver, in British Columbia, and China and Japan. If the United States Government does not soon take action in the matter of building up steamship lines of communication between ports of the United States and other parts of the world our Northern neighbors will be very far in advance of

us in this respect. The business interests of San Francisco are especially stirred up on this question.

## OBITUARY.

JAMES BEGGS.

James Beggs, senior member of the firm of James Beggs & Co., No. 9 Dey street, in this city, dealers in stationary engines and machinery, died suddenly by his own act, in Trenton, N. J., last Friday. Stepping before a mirror he deliberately fired a pistol, killing himself instantly. As his pecuniary circumstances were good, the rash deed is attributed to temporary mental aberration. Captain Beggs, as he was commonly called, on account of his military associations, was a man of excellent business capacity, of fine presence and genial in personal intercourse. He was born in Paterson, N. J., 46 years ago. His father, a native of Scotland, was then foreman of the old Camden and Amboy locomotive shops, and his death made it necessary for young James to start work at an early age. He learned his father's trade at Red Hook Point and worked his way up to the position of master mechanic of the Delaware, Lackawanna and Western Railroad shops, at Scranton, Pa., before he was 26 years old. He next became foreman over 800 men at Crane Bros.' elevator works in Chicago, and eventually started business on his own account in this city under the firm name of James Beggs & Co. After a time George N. Robinson entered the firm, but the name was unchanged, and about ten years since it moved to the present place of business, at No. 9 Dey street. The firm are agents for the Erie Iron Works, of Erie, Pa., large manufacturers of boilers and engines. Mr. Beggs leaves a widow and one daughter, the wife of Charles Cooke, of the Cooke Locomotive Works, in which his father-in-law once worked as a machinist. He was considered one of the best mechanical engineers in America and was famous as an expert and consulting engineer.

J. T. Lewis, of Yonkers, N. Y., representing New York capitalists, is at the Lafayette Hotel, Philadelphia. Having spent a week in Pittsburgh looking into the question of tin-plate manufacturing, he has examined into the prospects of the vicinity of Philadelphia under the guidance of F. R. Phillips, of 407 Walnut street, who is thoroughly posted in the practical details of tin-plate making in all its branches, having operated similar establishments in South Wales. Mr. Lewis is of the opinion that Eastern Pennsylvania offers the greatest advantages for practical reasons, and it is expected that arrangements will be completed at an early date to commence operations.

The Globe Iron Works Company, steel ship builders, of Cleveland, have entered into a contract for the construction of four boats for the Minnesota Iron Company, all of them to be alike and all of them duplicates of the six steamers of the Northern Line launched from the same yard. These are the boats which it was expected would be built by a new steel ship-building plant at Chicago. The four are to cost \$800,000, and all are to be out within a year. The Globe Company have also contracted for two more boats for the Lehigh Valley Transportation Company, duplicates of the E. P. Wilbur, Cayuga and Seneca, launched from the same yards. These will cost \$500,000, and with the Harvey Brown boat already under way will make seven steamers, or \$1,300,000 worth of vessel property, which this company will build within the next 12 months.

## The Craig Russia Sheet-Iron.

Joshua S. Ingalls & Co., of Troy, Ohio, after three years of unceasing experimental work, embodying the Craig process of producing steel sheets that would resemble Russia iron in appearance and quality, announce that they have at last succeeded in passing that stage and are now producing an extra quality of sheet-steel that will readily adapt itself to all purposes for which Russia iron has heretofore been used. A brief description of the process will doubtless be of interest.

After the sheets are drawn to gauge their process, which is protected by several patents, consists of, first, painting the sheets upon both sides with ingredients composed principally of the oxides of the softer metals, which under the subsequent heats form so intimate a mixture with the sheet-steel as to give it a pliable and elastic surface susceptible of a high degree of luster, which is at the same time very tenacious to the main body of the sheets. After heating in furnaces wherein natural gas is used as a fuel they are subjected to hard hammering under powerful steam-hammers, producing a brilliant polish. The sheets are then taken to a shear and their edges trimmed, when they are packed into cases containing about 250 pounds each for shipment.

At present the company manufacture the lighter gauges only, from Nos. 24 to 28 inclusive. The aim of the company is to manufacture an article as nearly like the genuine Russia iron as possible, not only in its color and luster, but also in the other essential qualities—viz., tenacity of scale, ability to withstand rusting and holding its color under long-burning heats in actual wear. It is a low-carbon, soft, tough and pliable fabric, capable of being worked into most difficult shapes, and holds its scale remarkably upon bending.

The company occupy an acre of ground immediately adjoining the Indiana, Bloomington and Western Railroad and Cincinnati, Hamilton and Dayton Railroad, upon which suitable buildings have been erected, covering annealing-furnaces, pickling-vats, steam-hammers, shears, rolls, &c. The present capacity of the mill is from 2 to 3 tons of finished product per day, single turn, depending somewhat on the gauges produced, for which a ready sale is found. The company will in the near future build an addition to the present plant to be used as a warehouse, and will add other needed improvements.

For the information of those of our readers who may be interested in the matter, we will state that we have recently received a letter from E. W. L. Biermann, wholesale dealer in chemical metallurgical products, of Hanover, Germany, which is as follows: "I frequently receive inquiries about tungsten and wolfram, and sell the same for cash, free on board at Hamburg, of the purest quality (76 per cent.) and ground (60 per cent.), at ruling rates. Furthermore, I handle all tungsten chemical preparations, wolframa (wolfram in the metallic state), wolfram alloys—in fact, whatever preparations there are in which tungsten enters as an ingredient."

Sensational press dispatches last week announced that Carnegie, Phipps & Co., of Pittsburgh, Pa., had made a reduction of \$6 per ton in their price of steel plates. The rumor was evidently put forth for stock-jobbing purposes, as the cut said to have been made was out of all reason in the present excellent condition of the market. The report was very promptly denied by the firm interested, and they contemplate the adoption of energetic measures to punish its malicious author.



### The Scripps League.

The steamer *City of Rome*, which sailed from this port on Wednesday, has on board as representative a gathering of American workmen as perhaps ever set sail from the United States. They are the Scripps League Expedition of 50 American workmen, *en route* for Europe and the Paris Exposition. It will be remembered that France sent a party of representative workmen to our Centennial, and that Great Britain is now sending British workmen to the Paris Exposition. Congress was expected to take some action toward sending American workmen abroad, but as this plan was not carried out, Edward Scripps, president of the Scripps League of Newspapers, undertook to pay the entire expenses of sending 50 American representatives abroad. The plan was conceived by George G. Booth, business manager of the *Detroit News*, who laid the proposition before Mr. Scripps, with the above gratifying result. The Scripps League comprises the *News*, of Detroit; the *Press*, of Cleveland; the *Post*, of Cincinnati; the *Chronicle*, of St. Louis; the *Echo* and the *Sunday News*, of Detroit, all evening papers circulating largely among the working classes. These papers will, of course, be among the first to publish the observations of the expedition, but realizing that the territory covered by them is confined to the West, arrangements have been made with Bachelier & Co., publishers, *Tribune* Building, this city, through whom papers may negotiate for letters written while abroad, and for the final reports of the different representatives. It is expected that the entire observations embodied in the complete report of each representative will be afterward compiled in book form by Julian Hawthorne and issued in one or possibly two volumes.

The selection of these representatives was in all cases left to the judgment of the working classes themselves, to their employers and to those most conversant with the characteristics and intelligence of those suggested. As a result of this, the party is made up of men and women who, while being actual workers in their respective trades, are also of marked general intelligence, capable of observing what they see and of communicating the results of their observations to the large working classes which they represent. The workmen come from every part of the country. The millwright comes from Minneapolis, the great milling industry center; the foundry man from Marshall, Texas; the piano-maker from Boston; the shoe-hand from Cincinnati; the electrician from St. Louis; the furniture-maker from Grand Rapids; the stove-maker from Detroit, &c. Who these representatives are and their respective capabilities are set forth in a neatly-printed book issued by the Scripps League, which gives the portraits and biographies of each representative, the programme of their tour, the origin of the project, and letters of commendation from such men as Secretary of State Blaine, Charles Dudley Warner, Hon. Roger Q. Mills, Senator Quay, Edward Everett Hale and others of national repute.

Although the objective point of the expedition will be the World's Fair at Paris, yet it has been determined that the benefits to the workmen could be enlarged by sending the expedition to the leading industrial centers of Europe as well as to Paris. The route has, therefore, been laid out with a view to giving ample time for observation in Paris, with trips to such extensive manufacturing points as the great Krupp Gun Works, at Essen, the shipyards of the Clyde, the cutlery industry of Sheffield, &c. The party expects to reach Liverpool about August 1, where two days will be spent in visiting

the extensive wharves of this great Transatlantic port. From here the party goes to Manchester, with its huge factories and warehouses; thence to Birmingham and London, stopping long enough in each to visit the large manufactories and most notable points of interest. Upon their arrival at Paris the staff will divide into squads of about ten each to facilitate observation, each squad being made up of men whose trades are somewhat allied in character. After the exposition has been thoroughly exhausted the party goes to Lille to visit the great factories, and thence into Belgium, where the industries of Brussels and the huge maritime arsenals and docks of Antwerp will be visited. In Germany a trip will be taken up the Rhine from Coblenz to Cologne, thus covering the most romantic portions of that historic and legendary stream. At Essen the mammoth establishment of Herr Krupp, with its 50,000 working people living on the co-operative plan, will be inspected. After crossing the Channel the party proceeds to Sheffield, where the large factories producing cutlery, plated-ware and type will be visited. Next the great shipbuilding industries of the Clyde will be inspected at Glasgow. The party will set sail from Liverpool on September 4 and expect to arrive in New York about September 11.

Robert E. Masters, formerly foreman of the Columbus (Ga.) Iron Works, and now at the head of the Marshall Car-Wheel and Foundry Company, of Marshall, Texas, and an authority on foundry subjects, will represent the foundry trade abroad. The iron and steel working industry will be represented by William Hanna, a well-known iron and steel worker of 35 years' experience, and a native of Pennsylvania. The machinery trade will be ably represented by R. M. McBeth, of Cincinnati, an engine builder of prominence, and long a close observer of progress in this line. The great stove industry of the United States sends as its representative W. J. Keep, superintendent of the Michigan Stove Company, Detroit, a gentleman well known in scientific circles, and famous as the author of a system of testing known in this country and abroad as Keep's tests. Mr. Keep is familiar to the readers of *The Iron Age*, which has published several of his valuable papers. James Bunn, who has charge of a large electrical plant in St. Louis, will represent the electrical engineering field abroad, while Isaac Cheney, of Minneapolis, whose knowledge of the milling industry is as wide as the industry itself, will make a critical comparison between our methods and those practiced abroad. Joseph Thorp, the oldest engineer on the Mobile and Ohio Railroad and a member of the Brotherhood of Locomotive Engineers, goes as the representative of the locomotive engineers, and W. R. Wilbur, an expert in the manufacture of bolts and nuts, and who has received several patents for improvements in tools and machinery, notably the cold nut press, will make a study of the bolt and nut industry abroad.

The expedition staff consists of the following gentlemen: Charles T. Thompson, director and editor; Julian Hawthorne, L. T. Atwood, C. B. Williams and F. W. Graves, correspondents; Frank Ver Beck, artist; H. N. Wilder, photographer; Fred. R. Burton, advance representative, and Paul Du Pont, courier.

The commission appointed to examine the New York Post-office recommends a considerable increase of the force. Various alterations are considered necessary. Eventually an entirely new building will be necessary, and the opinion is expressed that it should be further up town—a suggestion that will not be palatable to the business men of the lower wards.

### PERSONAL.

John Rinard, superintendent of the converting department of the Edgar Thomson Steel Works, at Braddock, Pa., has been appointed to the position of night manager, to succeed Thomas McDonald, resigned. Consor McClure has taken the position of master roll-turner, held for many years by Robert Morris, who died recently.

E. P. Botsford, formerly secretary of the old coke syndicate, at Pittsburgh, but more recently connected with the Connells-ville Coke and Iron Company, of that city, has accepted the position of secretary and treasurer of the Shenandoah Furnace Company, at Roanoke, Va. Mr. Botsford will take charge of his new position on August 1 next.

The Pittsburgh *Post* recently published the following concerning Charles M. Schwab, who is connected with the Homestead Steel Works, at Homestead, Pa.: "A gentleman occupying an unenviable position during the late Homestead strike is the superintendent of the mammoth plant there. He is Charles M. Schwab, who, one might possibly judge, wears a beard and is full of years. But this is not the case. Although occupying a most responsible position, Mr. Schwab is a young man—probably not over 28 years old. Strange to say, he has lost no popularity with the men, despite the trouble. They appeared to appreciate the fact that he was carrying out instructions, not framing them. He enjoyed the demonstration of Sunday night as much as the active participants did."

Nathaniel Roberts, constructing engineer, formerly with Witherow & Gordan, Pittsburgh, has opened an office at Anacostia, Washington, D. C., and is prepared to furnish working drawings and specifications and superintend the construction of blast-furnaces and hot-blast stoves, Bessemer steel works, bridges and roofs, general machinery, &c.

When the steam-engine works of W. J. Innis & Co., of Oil City, Pa., were transferred to the Oil Well Supply Company, Limited, P. H. Kane, junior member of the firm, was requested to remain in the works as foreman. He had contributed very materially to the success of the concern. Excellent opportunities in other directions were open to him, and it was with considerable reluctance that he finally consented to remain until everything was running smoothly. Having concluded to engage in business elsewhere, he has now resigned his position. The employees of the engine department of the company adopted a series of very flattering resolutions on the occasion of his withdrawal, showing the very high esteem with which he was regarded.

Prof. George H. Cook, of the Geological Survey of New Jersey, has furnished us with a geological map of New Jersey, which is drawn on a scale of five miles to an inch. The map is very handsomely executed and printed on stiff paper, with the various geological formations represented in different colors. It is an exceedingly creditable piece of work, both to Professor Cook and to the State.

The National Association of Window Glass Manufacturers, at their semi-annual convention in this city last week, reported that trade prospects are bright. The president's report stated that both the home production and the imports of the past year were the largest ever known. Since last September 3,200,000 boxes of American glass have been put out. The next convention will be held in Washington, January 15, 1890.

# TRADE REPORT.

## Chicago.

Office of *The Iron Age*, 50 Dearborn street,  
CHICAGO, July 22, 1889.

**Pig-Iron.**—The market was more active last week. General foundry men are buying for their immediate wants in larger tonnage, and manufacturers of specialties continue placing orders for the year's supply. Many sales ranging from 100 to 500 tons were made at an average advance of 50¢ per ton. Options and privileges that were granted some time back are being closed up or called off. Furnace men talk as if prices were upon an adamant basis. Some of the Charcoal-Iron makers have advanced their figures beyond the confines of the market. Available Lake Superior Coke Irons are practically limited to one producer, but still sold at a price that prevents the selling of outside brands. More sales of Gray Forge and Mottled could be made if the supply was greater. Southern makers are asking more for their Iron than they can get here. Sales of several 100 and 300 ton lots are reported, while many more transactions could be made at 50¢ @ 75¢ per ton less than prices demanded. It is said that the demand for Ohio Softeners is reviving. For a time local Soft Irons have had full sway in this market. Some of the furnace men making Blackband Iron announce that they are sold up for three months. No additional secrets about the purchase of Bessemer Pig-Iron have leaked out. Local makers would not duplicate previous orders and prices. Quotations are as follows, cash, f.o.b. Chicago: Bessemer, \$17; Lake Superior Charcoal, \$18.50 @ \$19; Local Coke, No. 1, \$16; No. 2, \$15; No. 3, \$14; Chicago and Bay View Scotch, No. 1, \$16; American Scotch, (Blackband), \$17.50 @ \$18; Southern Foundry, No. 1, \$16.50; No. 2, \$15.50; No. 3, \$14.50; No. 1, Soft, \$15.50; No. 2, \$14.75; Gray Forge, \$14.50; Mottled, \$13.50 @ \$14; Tennessee Charcoal, No. 1, \$17.75; Alabama Car-Wheel, \$24 @ \$25; Hanging Rock, No. 1, \$18.50; Jackson County, No. 1, \$17.50 @ \$18; Hocking Valley Silvery, No. 1, \$17; Missouri Charcoal, No. 1, \$18.50.

**Bar-Iron.**—There are a good many buyers in the market, but they do not like to place orders at a 10¢ advance which is about what mills are asking. Consumption has materially increased since June 1, and consequently merchants' stocks were reduced more rapidly than they expected, which forces them to buy this month before all the mills are in full working condition. On base orders mills quote 1.65¢ @ 1.70¢, half extras, f.o.b. Chicago, for Common, 1.75¢ @ 1.80¢ for Single Refined and 1.85¢ @ 1.90¢ for Best Refined. Some of the makers are so elated over the favorable prospects of trade that they ask 1.60¢ at mill for Common Bars. Out of store jobbers quote Common at 1.70¢ @ 1.75¢, Single Refined at 1.85¢ and Best Refined at 1.90¢ @ 2¢.

**Structural Iron.**—Last week was the first one for some time that there was not some new project added to the list. Mills are busy on contracts and not working quite so hard for orders. In small lots from stock Beams, Channels and Angles are in excellent demand. Some advance in prices is reported. We quote as follows, f.o.b. Chicago: Angles, 2.15¢ @ 2.25¢; Universal Plates, 2.20¢ @ 2.30¢; Sheared Plates, 2.25¢; Tees, 2.55¢; Beams and Channels, 2.90¢. From store: Angles, 2.40¢; Tees, 2.65¢ @ 2.70¢; Beams, 3.40¢.

**Plates, Tubes, &c.**—Manufacturers of Plates are slow on deliveries. Consumers are complaining and in some cases buying

small lots out of stock to bridge the necessity. General trade is good for all kinds and numbers of Sheets and Plates in small lots. Makers are firm in price, only taking such orders as they can most conveniently supply. Quotations are as follows, from store: Nos. 10 to 14 Iron Sheets, 2.60¢ @ 2.70¢; Nos. 10 to 14 Steel Sheets, 2.75¢ @ 2.80¢; Tank Iron and Steel, 2.50¢ @ 2.60¢; Shell Steel, 3¢; Flange Steel, 3.50¢; Fire-Box Steel, 4.25¢; Otis Steel, 5.50¢; Ulster Iron, 3.75¢; Boiler-Rivets, 4¢ @ 4.25¢. At the late meeting of the Pipe manufacturers Boiler-Tubes were again advanced and jobbers are now quoting 52½¢ discount on 1½-inch and less and 57½¢ discount on 2-inch and larger. The demand for Tubes is very good.

**Sheet-Iron.**—The heavy trade in Sheets is starting in early, and jobbers already anticipate that their stock will be inadequate to meet the demand. Manufacturers have more orders now than they can comfortably take care of, and yet there appears to be no let up in the demand. Their prices pretty generally are on a basis of 3¢ on No. 27, at mill. From store jobbers quote 3.10¢ for No. 24, 3.20¢ for Nos. 25 and 26, 3.30¢ for No. 27.

**Galvanized Iron.**—There is a fair demand for the best grades of Iron out of store, which jobbers quote at 65¢ off on Juniata and 65¢ and 5¢ off on Charcoal. Stocks in the leading sizes are low. Business is not brisk in the cheap grades and manufacturers' prices are weak and irregular. Their quotation at 70¢ off on Juniata is supposed to be below cost, and yet it is said that these figures have been shaded.

**Merchant Steel.**—Inquiry for the general line of Steel is good. Not all inquiries, however, result in orders, but those that do make quite an active business. The heavy orders go direct to the mills, and it was one of these that we referred to last week when the types made us say 800 tons. The aggregate amount of that order, including special shapes, was close to 8000 tons. Buyers of these quantities are scarce, but there are quite a number of orders that will run into the hundreds that have not yet been placed. Manufacturers quote, f.o.b. Chicago: Open-Hearth Machinery Steel, 2.15¢; Tire Steel, 2.25¢; Toe Calk, 2.30¢ @ 2.50¢, flat; Spring Steel, 2.25¢; Soft Steel Bars, 2¢; Open-Hearth Plow Stock, 2.50¢; Crucible Plow Stock, 3.50¢, and report an excellent demand from plow-makers. From store jobbers quote Mild Machinery Steel, 2.10¢ @ 2.30¢; Tool Steel, 7.75¢ @ 8.50¢; Specials, 12¢ @ 25¢; Crucible Spring Steel, 3.50¢ @ 3.60¢; Open-Hearth Spring, 2.50¢; Open-Hearth Machinery, 2.40¢ @ 2.60¢; Sheet-Steel, 7¢ @ 10¢; Tire Steel, 2.30¢.

**Steel Rails.**—There is considerable pressure on Rail manufacturers to take orders for early delivery, many of which cannot be accepted. It is said a number of orders ranging from 3000 to 8000 tons were placed at figures ranging from \$28.50 to \$29. Mills quote \$29.50 @ \$30. There appears to be an increase in the demand for light Rails. Eastern mills making a specialty of light weights are refusing orders for delivery before October, and as Western mills are also full prices are very firm at \$33 @ \$34 on 30-lb and \$38 @ \$40 on 12-lb and 20-lb Rails. The greater portion of the demand for light Rails comes from the West and South.

**Track Supplies.**—There was a pretty good demand for Track Supplies last week. Manufacturers are now asking 1.75¢ @ 1.80¢ for Iron Splice-Bars, 1.85¢ @ 1.90¢ for Steel and 1.89½¢ @ 1.90¢ for Spikes, f.o.b. Chicago. Bolts with Square Nuts are quoted 2.50¢ @ 2.55¢; Hexagon Nuts, 2.60¢ @ 2.70¢.

**Old Rails and Wheels.**—It is probable that the demand for Old Rails is not so great, and that prices are a little weaker. The nominal quotation would be about \$21.50, as no transactions have been reported. Inquiries are falling off and sellers are now looking for buyers, but still ask from \$1 to \$1.50 a ton more than figures named. Old Steel Rails, long lengths, are nominally quoted at \$18; short lengths at \$14 @ \$14.50. Old Car-Wheels are in fair request, and sellers and buyers are about \$1 a ton apart on prices; \$18 is freely offered and very few transactions effected. A lot of 350 tons, which was offered at this figure two weeks ago, has been withdrawn from the market.

**Scrap-Iron.**—With the exception of several very small lots there have been no sales. Dealers are holding prices very firm. Buyers are deferring placing orders as much as possible. Dealers' quotations are as follows per ton of 2000 lb: No. 1 Forge, \$18; No. 1 Mill, \$14; Car-Axles, \$22 @ \$23, net ton; Horseshoes, \$18.50; Wrought Turnings, \$11; Axle Turnings, \$13; Cast Borings, \$8.25; Cast Machinery, \$11.50; Leaf Steel, \$14.50; Coil Steel, \$13.50; Locomotive Tires, \$15 @ \$16; Mixed Country Wrought, \$12 @ \$13.

**Hardware.**—No changes in the condition of trade or in prices have occurred in the last week. Business with the leading houses continues very good on the whole line of Shelf and Heavy Hardware. The anticipated falling off in demand is slow coming. Very few changes in manufacturers' price-lists have occurred this month, compared with July of former years. Collections are becoming a little slow, but are still fair.

**Nails.**—Manufacturers are holding to their advance very tenaciously, but not selling very many Nails. There is considerable uniformity in their asking price, which is \$1.70 rates at mill. In carload lots jobbers quote Cut Nails at \$1.85 and Wire Nails at \$2.30. From store small lots are quoted at \$1.90 on Cut Nails and \$2.35 on Wire Nails. The demand from country buyers is declining for both classes.

**Barb-Wire.**—Trade is quiet and prices unchanged at 2.75¢ for Painted and 3.35¢ for Galvanized, in small lots.

**Pig-Lead.**—The market is unexpectedly quiet. Under the withdrawal of buyers, refiners have made efforts to sell for immediate delivery at 3.80¢, but no sales are reported. For August delivery 3.85¢ is asked. The inactivity of the market is largely attributed to the withholding by the Treasury Department of the decision under what duty Mexican Ores shall be admitted.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,  
PHILADELPHIA, Pa., July 23, 1889.

The week's developments have been, on the whole, of a favorable character, prices in all cases being steady, while advances may be noted in Muck-Bars, Merchant-Bars, Wrought-Iron Pipe and Nails. The general increase in the demand is also an encouraging feature, and the best opinions incline to a belief in continued activity and still better prices as the season advances.

**Pig-Iron.**—There is no perceptible change in the position of Pig-Iron since date of our last report. There is a steady call for deliveries on previous contracts backed by a demand for small lots, which keeps the furnaces in good condition. As a matter of fact some are inclined to find fault because of the urgent calls for prompt delivery, which are said to be much larger than usual at this season. This, with a heavy demand for Finished Iron, accom-



panied by advancing prices in certain specialties, imparts a sympathetic feeling of strength in the raw material, although, as we have already said, there is no quotable change in prices. Advices from the West and South are also of a favorable character, so that there is everything to encourage sellers, without anything to counteract that feeling. There is really little more that can be said on the subject. The output at furnaces is likely to show some increase during the next 60 days, but from all appearances consumption will be in proportion, so that there is no immediate danger of overproduction. Prices show more uniformity than they have for a long time past. There is very little good iron to be had at less than \$17.50, delivered, for No. 1 Foundry or \$15.25 for Gray Forge; some ask more than that. Probably \$17 @ \$18 for No. 1 Foundry covers both extremes; \$16 @ \$16.50 for No. 2, and \$15 @ \$15.50 for Gray Forge. Southern Irons are not pressed for sale, although good buyers might get in at \$16.50 for rail shipments of No. 1 or at \$14.50 for Gray Forge. But sellers are evidently not anxious for business at the moment, as they believe their chances a month hence will be equal to what they are to-day, if not better.

**Blooms.**—The market is irregular, and unless parties are in a position to make firm offers it is difficult to find what would be accepted. There is a heavy demand, but the supply appears to be ample, so that while one may not quote at all others ask an advance, while still others can be found who are willing to accept the old figures. Quotations are therefore more or less nominal, as follows, say: \$28.50 @ \$29, delivered, for Nail Slabs; \$30 @ \$31 for Tank Slabs; \$32.50 @ \$33.50 for Shell Slabs; \$36 @ \$37 for Flange, and \$38 @ \$40 for Fire-Box; Charcoal Blooms, \$52 @ \$54; Run-out Anthracite, \$41.50 @ \$42.50; Scrap Blooms, \$32 @ \$33 per "Bloom" ton of 2464 lb.

**Muck-Bars.**—The demand has been very active during the past few days, with sales reported at \$28.50, at mill, and \$29, delivered. Buyers are still in the market at these prices, but mills seem to be sold up, and the offerings are very light.

**Bar-Iron.**—The market has improved considerably during the past week, large sales having been made at advancing prices. An advance of  $\frac{1}{10}$ ¢ has been made to 1.95¢ from store, and mills generally ask in proportion, say 1.80¢ @ 1.90¢, according to size of order, specifications, &c. There is still a great deal of inquiry, and it seems now as though the Bar manufacturers were going to have their turn, although it is still possible to find parties here and there willing to accept a desirable order at pretty near to the old figures. One such order was taken yesterday by a mill in the West for guaranteed iron at 1.75¢, delivered, Philadelphia. This, however, is quite exceptional, as 1.85¢ is about the figure for a really first-class article. Skelp iron is also in very active demand, large sales having been made at 1.75¢ @ 1.82½¢ for Grooved and 1.95¢ @ 2¢ for Sheared. Sellers ask a further advance, say 1.85¢ for Grooved, and 2.1¢ for Sheared.

**Plates.**—The demand has been less urgent during the past week, and some of the mills are not as firm as they were at that time. There is a large amount of work in sight, however, so that the lack of demand is not likely to be very protracted. On the contrary, the outlook is of a most encouraging character, and the chances favorable for a decided renewal of activity and possibly some further advance in prices. At the moment there is some irregularity, but the following are the usual asking prices: 2.1¢ @ 2.2¢, delivered, for Ordinary Plates and Tank

Plates; 2.10¢ @ 2.25¢ for Universal Plates; Shell, 2.4¢ @ 2.5¢; Flange, 3.25¢; Fire-Box, 3.7¢ @ 4¢; Steel Plates, Tank and Ship Plate, 2.2¢ @ 2.30¢; Shell, 2.5¢ @ 2.7¢; Flange, 2½¢ @ 3¢; Fire-Box, 3½¢ @ 4¢.

**Structural Material.**—The mills are very full of work, while continued inquiries point to a heavy demand during the balance of the year. Manufacturers express the fullest confidence in regard to the outcome of business, and are quoting prices with a good deal of caution, the general tendency being toward higher figures, although for the present prices are about as follows, delivered, say: Bridge Plate, 2.10¢ @ 2.15¢; Angles, 2.10¢ @ 2.20¢; Tees, 2.6¢ @ 2.7¢; Beams and Channels, 2.8¢ for iron or steel.

**Sheet-Iron.**—The demand continues to be of a most satisfactory character; mills all busy and prices firm. It is believed that consumption is the heaviest on record, with every probability of its continuing during the balance of the year. Prices for carload lots about as follows, and very firm:

Best Refined, Nos. 14 to 20.....	3¢
Best Refined, Nos. 21 to 24.....	3.20¢
Best Refined, Nos. 25 to 26.....	3.40¢
Best Refined, No. 27.....	3.50¢
Best Refined, No. 28.....	3.60¢
Common, $\frac{1}{4}$ ¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3½¢
Best Soft Steel, Nos. 21 to 24.....	3½¢
Best Soft Steel, Nos. 25 to 26.....	3¾¢
Best Soft Steel, No. 27.....	4¢
Best Bloom Sheets, $\frac{1}{4}$ ¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.65 ¢
Common, discount.....	.67½ ¢

**Steel Rails.**—The market is firm, although sales have not been of any great magnitude of late. There is a good deal of inquiry, nevertheless, with a strong probability of important contracts being closed at an early date. Asking prices are from \$28.25 to \$29, at mill, with several fair-sized lots taken at \$28 @ \$28.50. Sellers say that \$28.50 is about their idea of value, and that the order would have to be specially desirable to secure attention at less money.

**Old Rails.**—Very little doing. Sales are reported at from \$23 to \$23.50, delivered at mills in the interior, but there is nothing doing in spot lots.

**Scrap-Iron.**—There is a good demand for everything, and sales are easily made at the following quotations: \$20.50 @ \$21 bid, \$21.50 asked, for cargo lots; \$21 @ \$21.50 for carload lots, delivered, or for choice, \$22; No. 2 do., \$14 @ \$15; Turnings, \$14 @ \$15; Old Steel Rails, \$16.50 @ \$17.50; Cast Scrap, \$15 @ \$16; do. Borings, \$9 @ \$10; Old Fish-Plates, \$23 @ \$24; Old Car-Wheels, nominal, \$17 @ \$18, Philadelphia.

**Wrought Iron-Pipe.**—There has been an advance in Pipes, as will be noted below. The demand is heavy and prospects for the balance of the year are said to be unusually favorable. Discounts are now quoted as follows: Butt-Welded Black, 50 ¢; Lap-Welded Black, 62½ ¢; Butt-Welded Galvanized, 42½ ¢; Lap-Welded Galvanized, 50 ¢; Boiler Tubes, 50½ @ 57½ ¢, according to size.

**Nails.**—There is a good deal of irregularity in Nails, although the general tendency is toward higher prices. Lots from store are firm at \$2 and carload lots at \$1.90, although some quote still higher figures, while others would probably shade a trifle to realize prompt cash.

## Cleveland.

CLEVELAND, July 22, 1889.

**Iron-Ore.**—Mine owners, basing their calculations upon the remarkably active condition of the market, now estimate the year's output from the Lake Superior district at 6,500,000 tons and prophesy that

over 6,000,000 tons of Ore will actually have been sold when navigation closes. Some warrant for this estimate is found in the fact that the season's receipts at lower lake ports already exceed 2,850,000 tons, as against 1,500,000 tons on July 22, 1888. Sales to date are believed to aggregate 4,750,000 tons, while up to a corresponding period last year not over 2,500,000 tons of Ore of all grades had been sold. Furnace men are fairly well satisfied with present quotations and are buying liberally of the desirable grades of Ore still in the market. Gogebic Bessemer are selling all the way from \$4.60 to \$5.10, the latter price being demanded for some of the particularly rich Ores, while the output from the majority of the mines brings \$4.50 @ \$4.75. The sale during the past week of 75,000 tons of non-Bessemer has almost exhausted the supply of this kind of Ore. A 10,000-ton block of Menominee Bessemer Ore sold for \$4.75, f.o.b. vessels Cleveland, while 15,000 tons of non-Bessemer Hematite Ore brought \$3.75, same delivery. There is no scarcity of vessels, and charters are still being made at 90¢ from Escanaba, \$1.10 from Marquette and \$1.25 from Ashland and Two Harbors. Over 75,000 tons of Ore were unloaded from vessels at Cleveland during the past seven days, while 30,000 tons were forwarded to the furnaces.

**Pig-Iron.**—The market is recovering from its late depression gradually but none the less surely. The amount of business transacted during the past week is in excess of the record for any consecutive seven days since May 1. Dealers are confident of better prices before August, and are holding to the following quotations very firmly:

Nos. 1 to 6 Lake Superior Char-		
coal.....	\$20.00 @	\$20.50
No. 1 Strong Foundry, Bessemer		
quality, $\frac{1}{2}$ ton.....	16.00 @	16.50
No. 1 Strong Foundry, $\frac{1}{2}$ ton.....	15.50 @	16.00
No. 2 Strong Foundry, $\frac{1}{2}$ ton.....	15.00 @	15.50
No. 1 American Scotch, $\frac{1}{2}$ ton.....	16.00 @	17.00
No. 2 American Scotch, $\frac{1}{2}$ ton.....	15.00 @	16.00
No. 1 Soft Silvery, $\frac{1}{2}$ ton.....	16.50 @	17.50
Mahoning and Shenango Valley		
Neutral Mill Irons, $\frac{1}{2}$ ton.....	14.00 @	14.50
Mahoning and Shenango Valley		
Red Short Mills, $\frac{1}{2}$ ton.....	14.50 @	15.00

**Scrap-Iron.**—The market is not active, but a number of small lots of Old American Rails at \$21.50 have been sold. Old Wheels are in small favor even at \$19 per ton.

## Cincinnati.

Office of The Iron Age, Fourth and Main Sts., CINCINNATI, July 22, 1889.

**Pig-Iron.**—There has been less activity in the local market for Pig-Iron during the past week, but the strong tone has been well preserved, with confidence reposed in the future. One important feature has been the buying of Car-Wheel Iron, reflecting an increase in the demand for rolling-stock, which is usually allowed as a synonym for business prosperity. The differences in views of buyers and sellers respecting deliveries is one potent cause in decreasing the volume of transactions; sellers ask a further advance on October, November and December contracts over the prices current for August and September; consumers, however, are not disposed to meet higher prices than have already been established by liberal sales. There has been a good inquiry for Mill grades, but the actual sales show a larger movement in Foundry brands. Some inquiry of a speculative nature has again attracted attention, but no sales of moment are reported on this account. Among the larger and more important transactions have been 6000 tons Southern Car-Wheel at \$23 @ \$23.50, cash; 600 tons Lake Superior Car-Wheel at \$20, cash; 500 tons and 900 tons No. 1 Southern Coke Foundry at \$15, and 1000 tons No. 2 do. at \$14.50, cash. In addition there have been smaller amounts of the

same grades on the same basis, and in some instances 25¢ over these rates. White Iron has been sold in a small way at \$12.40 and Mottled at \$12.75, but Mottled is offered 25¢ lower, and a round lot could possibly be bought at a further reduction. Lake Superior Iron has been sold in a few hundred-ton lots at points nearer the furnace than Cincinnati at \$19.50 @ \$19.75, cash. Southern Gray Forge is still quotable at \$13.25 @ 13.50, cash, here. The following are the approximate prices current here at the close for cash, f.o.b.

Foundry.		
Southern Coke, No. 1	\$15.00 @	\$15.25
Southern Coke, No. 2	14.25 @	14.50
Southern Coke, No. 3	13.25 @	13.50
Ohio Soft Stone Coal, No. 1	16.00 @	16.50
Ohio Soft Stone Coal, No. 2	15.00 @	15.50
Mahoning and Shenango Valley	16.00 @	16.50
Hanging Rock Charcoal, No. 1	20.00 @	22.00
Hanging Rock Charcoal, No. 2	19.00 @	21.50
Tennessee and Alabama Charcoal, No. 1	17.50 @	18.50
Tennessee and Alabama Charcoal, No. 2	16.50 @	17.50
Forge.		
Strong Neutral Coke	13.25 @	13.50
Mottled Neutral Coke	12.25 @	12.75
Cold Short		13.00
Car-Wheel and Malleable Irons.		
Southern Car-Wheel	23.00 @	24.00
Hanging Rock, Cold Blast	22.00 @	25.00
Lake Superior Car-Wheel and Malleable	20.00 @	20.50

**Manufactured Iron.**—No important change has taken place during the week. The volume of business has been moderate, and prices have remained steady for all kinds.

**Old Material.**—There has been a better demand and a stronger market for Old Rails, with sales of 1000 tons at \$21.50, August delivery. Old Wheels have been steady and moderately active, with sales of 50 tons and smaller amounts at \$17.50, cash, on O. & M. R.R.

**Nails.**—There has been a fair jobbing trade and a steady market. Iron and Steel Nails, 12d to 40d, sell at \$1.85 @ \$1.90 per keg, with 10¢ rebate in carload lots, at the mills. Steel Wire-Nails sell at \$2.40 for 60d.

## Louisville.

LOUISVILLE, KY., July 22, 1889.

The market has been active during the past week, and several sales of magnitude have been made, one of 3000 tons, composed of Bright and Mill Irons, being the largest. Prices are fully maintained, and buyers are unable to obtain any concessions. A new Car-Wheel Iron, the Attalla, has just been placed on the market and is attracting a great deal of favorable attention. It will take high rank among the best Car-Wheel Irons:

Southern Coke, No. 1 Foundry	\$14.75 @	\$15.25
Southern Coke, No. 2 Foundry	14.25 @	14.75
Southern Coke, No. 3 Foundry	13.50 @	14.00
Gray Forge	13.00 @	13.50
White and Mottled, different grades	12.50 @	13.00
Silver Gray, different grades	13.00 @	13.50
Southern Charcoal, No. 1 Foundry	16.25 @	16.75
" " No. 1 Mill	14.75 @	15.25
Southern Car-Wheel, standard brands	21.75 @	22.75
Southern Car-Wheel, other brands	18.00 @	19.50
Hanging Rock Coke, No. 1 Foundry	15.50 @	16.00
Hanging Rock Charcoal, No. 1 Foundry	19.50 @	21.00
Hanging Rock, Cold Blast	20.75 @	22.75

## St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., St. Louis, July 22, 1889.

**Pig-Iron.**—During the past week a number of inquiries have been received from large buyers, aggregating several thousand tons, and while they did not result in immediate business, yet the class of consumers making the inquiries is of such a character as to warrant the trade in expecting orders therefrom later on. There have been a few sales of Gray Forge during the past week, one lot of 500 tons being sold at \$13.75, f.o.b. St.

Louis. Lake Superior Charcoal Iron shows more strength, and the demand is increasing, although a number of orders were placed a few weeks since at much lower figures than those quoted to-day, but the general condition of the market at the present time is entirely changed from that of three weeks since, and orders that would have been jumped at then are now allowed to pass unless the advanced figures are paid. Quite a number of the Southern furnaces have withdrawn from the market, as they are able to realize better prices nearer home, and consequently will not book any orders unless at full quoted rates. Taking everything into consideration, the prospect is better to-day than it has been for months, and unless something unforeseen happens prices are likely to harden, and with the increased demand which generally sets in about the middle of August or first of September there is every reason to expect higher prices. Sales are made at about the following figures for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry	\$15.50 @	\$16.00
Southern Coke, No. 2 Foundry	14.75 @	15.50
Southern Coke, No. 3 Foundry	14.25 @	14.75
Gray Forge	13.50 @	14.00
Ohio Softeners	17.00 @	19.00
Lake Superior Charcoal	20.00 @	21.50

### Missouri.

Charcoal Foundry, No. 1	16.00 @	16.50
Charcoal Foundry, No. 2	15.00 @	15.50

### Tennessee.

Charcoal Foundry, No. 1	17.50 @	18.00
Charcoal Foundry, No. 2	17.00 @	17.50

Connellsville Coke, f.o.b. East St. Louis, \$4.40; St. Louis, \$4.55.

**Bar-Iron.**—A large business was done in Bars during the week under review, and with the increased demand emanating from the Agricultural-Implement dealers, who are now placing orders for their year's supply, the outlook is very favorable. Jobbers have all they can handle and most of the mills are pretty well sold up. Small lots from store are quoted at 1.80¢, and, we are informed, cannot be had for less; in fact, in some cases 1.85¢ is asked. Carload lots are quoted from 1.60¢ to 1.65¢.

**Barb-Wire.**—As is usual at this season, very little business is being transacted, and reports both from manufacturers and jobbers show the same state of affairs, but judging from the number of inquiries received for delivery later on, it is quite likely the fall trade will start in very early and be unusually heavy. Small lots are quoted as follows: From 2.75¢ to 2.80¢ for Painted and from 3.35¢ to 3.40¢ for Galvanized; carload lots at from 2.65¢ to 2.70¢ for Painted and 3.25¢ to 3.30¢ for Galvanized, f.o.b. St. Louis.

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, July 22, 1889.

**Pig-Iron.**—The tone of the market is still firm, with a continued tendency in prices to advance. Consumers whose wants are not provided for are now obliged to hunt around to get their wants supplied, especially when they require immediate shipment, and most of them in that case are obliged to go 25¢ @ 50¢ better than the regular market prices quoted, and the question most prevalent is not "How much you will take," but "How much will you give?" Besides the increased demand and the consequent advance in price, there are other influences at work that have imparted to our furnace owners a much better feeling than existed a few weeks ago. The very abundant crops which appear now to be in sight, probably greater in their general character than ever before, have imparted to all business lines a spirit of encouragement that has permeated all enterprises in every direction, and those who

are engaged in the working of Iron in any form are certainly not an exception. Railroad building is more talked of and the car-shops are now having all the work they can attend to, and the consequence is that for the remainder of the year there will probably be more Iron melted by Southern foundries than in any one year in the past. There seems to be no disposition on the part of the furnaces to so control their products as to cause a high-priced market; in fact, the general expression is to hold prices about as they are. Prices will, however, depend more upon buyers than upon producers, but there is no disputing the fact that prospects are now good for higher prices in the near future. There is hardly a furnace in the South but what is able to hold every pound of Iron it makes for three to six months, excepting contracts already made, which, however, they are not at all likely to do; but under the present feeling they are slow to enter orders, and when they do the figures must be at the very top of the market.

## Pittsburgh.

Office of *The Iron Age*, 77 Fourth Ave., PITTSBURGH, July 23, 1889.

The general Iron and Steel situation continues to improve. Nearly all the mills and furnaces in the immediate vicinity are now in operation, and the output is large and increasing, but the demand continues fully equal to the output. Even the Cut-Nail trade, which here in Pittsburgh has been almost lost sight of for several years, is beginning to show signs of revival and attract attention. The railroads are doing a very fair business and the lines centering here appear to be holding rates steady.

**Pig-Iron.**—We can report a more active and stronger market, and within the past week some sales have been made at an advance of 25¢ per ton. Consumers generally are now anxious to buy, while furnace men are indifferent in regard to making additional sales. The latter look for still higher prices in the near future, hence it is not strange that they are indifferent about making additional sales, and it is this same belief that makes consumers anxious to buy. Sales of some 1000 tons of Gray Forge Iron were reported during the week at prices ranging from \$14 to \$14.25, cash, for July, August and September delivery—one sale made on Saturday at \$14.30. There are now but few, if any, sellers under \$14.25, cash, and some furnaces, pretty well sold up, are refusing to make additional contracts. There are very few furnaces in this district that have not more or less contracts on their books; some of them are sold from two to three months ahead. Quotations may be fairly made as follows:

Neutral Gray Forge	\$14.00 @	\$14.25, cash
All-Ore Mill	15.00 @	15.25, "
White and Mottled	13.00 @	13.50, "
No. 1 Foundry	16.00 @	16.50, "
No. 2 Foundry	15.00 @	15.50, "
No. 2 Charcoal Foundry	21.00 @	21.50, "
Cold Blast Charcoal	24.00 @	27.00, "
Bessemer Iron	16 15 @	16.25, "

At the present time of writing \$16.25, cash, appears to be the ruling price for Bessemer. Some sales, it is said, have been made at a still higher price. We should not be surprised if there was a further advance in all grades of Iron before another week.

**Muck-Bar.**—There is considerable inquiry, with but little offering, and \$27, cash, is the ruling price. The price quoted shows an advance of \$1 per ton within the past two weeks, and if Pig-Iron continues to advance still higher prices may be looked for.

**Manufactured Iron.**—There is an increasing demand for all kinds of finished Iron, and prices, while not quotably higher



as yet, are considerably firmer, in sympathy with the raw material. We continue to quote upon a basis of 1.60¢ @ 1.70¢ for Bars, 60 days, 2 % off for cash. Skelp-Iron is firmer and is likely to go higher. We continue to quote at 1.62½¢ @ 1.65¢ for Grooved and 1.90¢ @ 1.95¢ for Sheared.

**Nails.**—There appears to be considerable inquiry for Cut Nails and the market is showing more strength in consequence. Owing to the exceedingly unsatisfactory condition of the market for some years past production has been very much reduced and stocks, both in hands of manufacturers and jobbers, are down lower than for a number of years. Moreover, the feeling appears to be gaining ground that the Cut Nail will again come to the front. There will be a meeting of Western Nail manufacturers at Cleveland to-morrow (24th inst.) to revise the card and make the extras on all sizes conform to the cost. We continue to quote Cut Nails at \$1.90, 60 days, 2 % off for cash. Steel Nail Slabs have advanced \$1 7/8 ton within the past few weeks and bid fair to go still higher. A well-posted Nail broker sends out a circular which concludes as follows: "We advise buying Cut Nails for future delivery, but not Wire Nails, which, we think, will be lower within the next 30 days." The Nail business, so far as relates to Pittsburgh, has been under a cloud for several years.

**Wrought-Iron Pipe.**—There appears to be no abatement in the demand for Pipe; mills are all fully employed and some of them report that it is difficult to keep up with their orders. At the regular monthly meeting of the association, which convened at Manhattan Beach on the 17th inst., prices were again advanced, which may be taken as evidence that the Pipe trade is in good condition, otherwise the advance would not have been made. We now quote as follows: Discounts on Black Butt-Welded Pipe, 50 %; Galvanized do., 42½ %; Black Lap-Welded, 62½ %; Galvanized do., 50 %; Boiler Tubes, 1½ inches and smaller, 52½ %; 2 inches and larger, 57½ %; Casing, 5½ inches, 60 %.

**Old Rails.**—The offerings of Old Material are still very light, and the market continues on the upward turn; we now quote at \$23.75 @ \$24. An offer of \$23.75, spot cash, was made and refused for a lot of 1000 tons. In this market there has been an advance of almost \$2 7/8 ton as compared with the lowest point. Old Steel Rails are still quoted at \$19.50 @ \$20.50 for long and \$17 @ \$17.50 for short pieces.

**Billets, Blooms, &c.**—There is a good deal of inquiry for Bessemer Steel Billets, mills are nearly all oversold, and the market continues strong, with makers indifferent about making additional contracts, especially for future delivery. We now quote at \$27.50 @ \$28, cash; Bessemer Steel Nail Slabs higher, with sales reported at \$27.50; Rail Crops continue scarce, and may be quoted, in the absence of sales, at \$17.75 @ \$18, and Bloom Ends at \$17.25 @ \$17.50.

**Steel Rails.**—The mills here are both pretty well sold ahead and are not in condition to take orders for immediate or near-by delivery. Heavy sections may be quoted at \$28 for fall and winter delivery.

**Railway-Track Supplies.**—There is an increasing business, but prices remain unchanged. Spikes, 1.55¢, 30 days or less, at works; Splice-Bars, 1.60¢ @ 1.70¢; Track-Bolts, 2.75¢ with square and 2.85¢ with hexagon Nuts.

**Old Material.**—There is an improved demand and the market is firmer. No. 1 Wrought Scrap, \$19.50 @ \$20, net ton; sale, 300 tons, at \$19.50; Wrought Turnings, \$13 @ \$13.50; Car-Axles, \$24 @

\$25; Cast Scrap, \$14.50 @ \$15, gross; Cast Borings, \$11.50 @ \$12; Old Car-Wheels, \$18.

## Detroit.

**WILLIAM F. JARVIS & Co.,** under date of July 22, 1889, say: Even a larger volume of Lake Superior Charcoal Iron has been sold during the past week than before. We have canvassed among some of the furnaces and find stocks in their hands to be very small. At the same time, the largest buyers are well supplied, and cannot be looked to for much further buying during the next few months. Prices are absolutely the same as they have been. To be sure, the large buying has created a firmer feeling, but up to the present time this is the only apparent result. Some large blocks of Ohio Irons have recently been purchased here, and every one reports trade active and all sanguine of better prices. We repeat quotations of last week, as follows:

Lake Superior Charcoal, all numbers	\$19.00 @ \$19.50
Lake Superior Coke, all ore	18.00 @ 18.50
Lake Superior Coke, cinder mixed	17.50 @ 18.00
Standard Ohio Black Band	17.50 @ 18.50
Southern No. 1	16.50 @ 17.00
Southern Gray Forge	15.00 @ 15.50
Southern Silvery	16.00 @ 16.50
Jackson County (Ohio) Silvery	18.00 @ 18.50
Old Wheels	18.00 @ 19.00

## New York.

Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, July 24, 1889.

**Pig Iron.**—Current business is confined to small lots, some dealers reporting an active demand in this respect. Others, however, are experiencing the usual mid-summer dullness, but state that their furnace companies are so well sold up that they really have no Iron to offer. The leading companies supplying this market are falling behind in their shipments, and their customers are urging more rapid deliveries. The Thomas Iron Company particularly were never before so pressed for Iron by their patrons. The heavy contracts booked during the past two months are now having their effect on the producers, and the prospects are altogether most flattering for the maintenance of the advance in prices which has been made. Inquiries are in the market for round lots of Iron covering deliveries for the next three months, but purchasers hesitate to pay the rates asked, hoping that by holding off a little they can do better. This hardly seems likely, as even the lower grades of Iron have appreciably stiffened within the past week and \$15.25 is now a very close figure for Northern Gray Forge, while \$15 is asked for Southern. On No. 1 Southern \$16.50 now appears to be the very bottom price. Quotations are as follows: No. 1 Anthracite Foundry, at tide-water, \$17 @ \$18; No. 2, \$16 @ \$17; Gray Forge, \$15.25 @ \$15.75; Southern No. 1 Coke Foundry, delivered at New York, \$16.50 @ \$17.50; No. 2, \$15.75 @ \$16; No. 3, \$15.50; Gray Forge, \$15.

**Scotch Pig.**—Prices have advanced on the other side, as was predicted last week, and freights are higher, but the market here does not respond. Every advance there checks business here, so that the week has been very quiet. Quotations are as follows: Eglinton, \$19 @ \$19.50; Dalmellington, \$19.50 @ \$20; Langloan, \$21; Summerlee and Coltness, \$21.50.

**Spiegeleisen.**—Business is quiet, with 20 % quoted at \$29.50, and 80 % Ferro \$60. German Spiegel is not to be had, the makers reporting their full capacity sold for the rest of the year. The large production of Steel Rails now in progress is expected to cause a heavy demand for this material later on, which will cause further advances in price.

**Wire Rods.**—Foreign are still quoted at \$43, ex-ship, but it is impossible to make sales in competition with domestic Rods made by Western mills. Importers regard their business in this line as extinct, for the time being at least. The Anderson Rod-mill, in Indiana, is now in operation, and the Allentown (Pa.) mill is also expected to start up at an early day.

**Finished Iron and Steel.**—A great deal of business is doing in the various products grouped under this head, and prices are gradually hardening. There is, however, much speculation as to what the fall months will develop. While the volume of business is now very large, the capacity for production is also large. Having completed their usual repairs, the mills are gradually resuming operations in all directions, and trade must continue to increase for some time to keep them all employed and thus maintain prices. The advanced cost of raw material and the rise in wages will help to stiffen the views of manufacturers, but they must at the same time have an outlet for their productions. We quote as follows for delivery on dock: Sheared Plates, 2.10¢ @ 2.15¢; Universal Mill Plates, 2.15¢ @ 2.20¢; Angles, 2.10¢ @ 2.15¢; Tees, 2.5¢ @ 2.6¢; Beams and Channels, 2.8¢. Tank Iron, 2.10¢ @ 2.20¢; Shell, 2.4¢ @ 2.5¢; Steel Tank, 2.3¢; Shell, 2.4¢ @ 2.5¢; Flange, 2.75¢ @ 2.8¢; Fire-Box, 3.25¢ @ 4¢; Common Bar-Iron, 1.6¢ @ 1.65¢; Medium, 1.7¢; Refined, 1.8¢ @ 1.9¢.

**Merchant Steel.**—Trade prospects are brightening, good orders of a miscellaneous character having been placed during the past week. Following are prices now quoted: Tool Steel, good brands, in large lots, 7¢ @ 7½; specials, 12¢ @ 20¢; Crucible Spring, 3½¢ @ 4¢; good Open-Hearth Machinery, 2.30¢ @ 2½¢; Bessemer ditto, 2¢ @ 2½¢; Open Hearth Spring, 2½¢ @ 2½¢; Tire 2.15¢; Toe-Calk, 2½¢; Sheet, 6½¢, 8½¢ and 10½¢. High-grade Steel is less active than the low grades.

**Miscellaneous Steel.**—Orders are increasing in number, but not in quantity. Buyers hesitate to place large orders at the advanced prices asked, but are gradually being educated up to them. There are numerous inquiries for Blooms and Billets, as well as Special Shapes, which will probably soon develop into business. Some large sales of Wire Billets have been made, and they are now quoted at \$29, at mill, for 1000-ton lots and \$38.50 @ \$40 for carloads.

**Steel Rails.**—Some 7000 tons were sold during the past week by Eastern mills, and further contracts were taken by Western works. An increase in the allotment has been asked by the latter, showing the continued demand for Rails in that section. It would be difficult now to place orders for delivery earlier than October. Prices are firm at \$28, at mill.

**Track Supplies.**—The orders placed since our last report were mainly for delivery in the South and called for but small quantities in each case. Quotations are as follows: Iron Fish-Plates, 1.80¢, at mill; Steel Fish-Plates, 1.75¢; Square-Nut Bolts, 2.70¢; Hexagon-Nut Bolts, 2.80¢ @ 3¢, according to quality; Spikes, 1.95¢ @ 2¢. Large Spike manufacturers are of the opinion that buyers have seen the lowest prices for this year, as the cost of raw material is advancing and the finished product must correspond.

**Old Rails.**—Negotiations are pending for considerable quantities of Old Iron Rails from both Northern and Southern sources of supply, but no actual sales have transpired during the week. Offers of \$22.50 have been declined by sellers, who ask \$23. A good demand is reported for Old Steel Rails, and sales have been made at \$19.50, delivered at mill on the line of the

road. Old Car-Wheels are quoted at \$19 @ \$20. No. 1 Wrought Scrap-Iron has been offered at \$20.50 on board cars at Jersey City, although most holders ask \$21.

## Financial.

The outlook in a business point of view is more cheerful. Speculation is less rampant. Railroad wrangles are less threatening. There is more confidence in the money situation. The settlement of the Carnegie strike removes a possible source of disturbance. Better than all is the assurance of an abundant wheat harvest, giving full employment to all means of transportation used, a new impulse to foreign commerce, besides unlocking large blocks of money for circulation all through the channels of domestic trade. Along with a favorable Government report there comes a positive contradiction of recent alarming reports from the Northwest. A St. Paul dispatch says: "Grain men who have just returned from a trip over the territory say that there will be probably two-thirds or three-fourths of an average crop in the Dakotas, while it is very generally acknowledged that the condition of affairs in Minnesota is much more favorable. The recent rains have wrought marvels, in some cases increasing prospects from 50 to 100 %. There is little or no improvement reported from South Dakota in the apparent condition of the crop, although the yield is turning out to be greater than anticipated in many sections. In Northern Minnesota the yield will be the best for years. Western Wisconsin and Northern Iowa also send in favorable returns." In commenting on the discouraging reports against Manitoba crops circulated from Toronto to the effect that the total yield this season would be less than half of last year's yield the *Winnipeg Free Press* says: "In some sections the wheat crop will be light; in others it will be almost, if not quite, as good as in the famous year of 1887. The average throughout the province will be great enough to permit of an export at least twice as large as that of last year." A. L. Mohler, assistant general manager of the Manitoba Railroad, who has just completed a thorough personal examination of the wheat crop along the lines of the Manitoba system, predicts that the country tributary to the Manitoba lines will furnish for shipment at least 32,000,000 bushels of wheat. The *Cincinnati Price Current*, reviewing the crop outlook, says: "Thrashing operations in winter-wheat districts are progressing rapidly in the Central States and there is much evidence to indicate that the yield is generally holding up to or exceeding the earlier expectations and that the quality is averaging well, the exceptions being of but moderate frequency. All things considered, the winter wheat prospect may be regarded as maintained at approximately 310,000,000 bushels, with possibilities seeming to be more in favor of some enlargement rather than of reduction of this quantity. The later advices from Dakota appear to suggest a tendency toward decline in the wheat prospect, while in Minnesota, Iowa, Nebraska and Wisconsin it is well maintained. The previous estimate of 165,000,000 bushels for spring wheat if changed is likely to be reduced."

The stock market has been dull and unsatisfactory. Rumors respecting railroad troubles had a depressing influence, and bears made considerable capital out of the shipment of about \$3,000,000 in gold on Saturday. Prices have declined within the last two weeks to about the lowest touched during the previous rate conflict between the trunk lines. On Monday the weakness of the Hocking Valley securities was conspicuous on the announcement that the road would default on its 5 % bonds

September 1 and that a receiver would be appointed. Atchison, Topeka and Santa Fe dropped to the lowest price yet recorded. The tone at the close was fairly firm, on a report that the bankers will soon convene a meeting of Western railroad managers. Representatives of six of the roads concerned in the Transcontinental Railway Association met in Chicago to consider the notice of the withdrawal by the Northern Pacific and Southern Pacific roads, but nothing was accomplished.

On Tuesday a sharp advance was stimulated by a semi-official confirmation of the statement that the Vanderbilts have secured a controlling interest in the Chesapeake and Ohio Road by the purchase of 100,000 shares of common stock. The grangers were affected by the expectation that the presidents of roads in the Interstate Railway Association would do something immediately to improve the Western railroad situation. The trusts were fairly active and higher.

United States bonds are quoted as follows:

U. S. 4½s, 1891, registered.....	106¾
U. S. 4½s, 1891, coupon.....	106¾
U. S. 4s, 1907, registered.....	128¼
U. S. 4s, 1907, coupon.....	128¼
U. S. currency ds.....	118

Time loans are in good request, borrowers looking for activity in money late in the summer, and rates are 4 % for 90 days, 4½ % for 4 months, and 5 % for 6 months. Lenders continue to discriminate against the trust loans. Commercial paper is in fair supply, but the demand is chiefly from out-of-town institutions. Rates are 4½ % @ 5 % for 60 to 90 day indorsed bills receivable, and 5½ % @ 6 % for 4 months acceptances. The bank statement of last Saturday did not fully reflect the withdrawals of gold for shipment to Europe on that day. The surplus reserve was increased \$624,725, and it now stands at \$7,254,825. Although the surplus reserve of the banks is \$19,185,575 smaller than in 1888, it is only \$1,242,500 less than in 1887. In loans there was a contraction of \$1,533,300. According to the Custom-House statement the exports of specie from this port for the week amounted to \$3,633,003. Since January 1 the trade is \$56,735,871, as compared with \$25,103,871 for the same time last year. A Washington dispatch represents Secretary Windom as having entire confidence in the Treasury situation; that he could see no evidence of money being tight so long as bonds are held back as they are. The price established, he said, is a liberal one, and on the bonds the holders are only getting about 2 %, while on the 4½s the interest is only a trifle over 1½, yet there is no great alacrity shown by the holders of these bonds to sell them to the Government and convert them into cash.

Clearing-House returns from 40 cities for the week show an increase of 12 % compared with the same time last year. New York gained 13.5 %; outside of New York the gain was 10.4 %. A good degree of activity is observed at leading points, including Minneapolis, Louisville, Denver, Pittsburgh and Cleveland.

The New York Tax Commissioners announce that the new tax-rate will be only 1.95. This is 0.27 lower than the rate of 1888, 0.21 lower than that of 1887 and 0.34 lower than that of 1886.

The International Maritime Exhibition, which was to be held in New York, will be held in Boston instead, and will be opened on November 4 at the Mechanics' Institute.

On Tuesday Secretary Windom visited the several sites proposed for the new stores in this city.

Among speculative commodities crude oil touched the highest point this year, \$1 ¾ barre, based on increasing exports. The scarcity of oil is due to a large extent to the arrival of a fleet of tank steamships which have heretofore been running to

Batoum, Russia. Breadstuffs are unsettled and slow. Spot wheat was lower, but advanced on reports of short crops in Russia and Hungary. Coffee is easy. Spot cotton steady at ¼¢ decline. Texas cotton promises a yield of 2,000,000 bales, 500,000 bales in excess of any previous year. Refined sugars are ¼¢ lower, with moderate trading. Provisions have a good undertone. Ocean freights are more active.

## Metal Market.

**Copper.**—The London market fluctuated but slightly since our last week's report, finally winding up at the same figures cabled at the time, viz: Spot, £41, and futures, £40. 5/, the sales running up 500 tons and no more. Everything on the part of the companies having been left in abeyance, these have succeeded in selling some more Copper to consumers at the old price of 12¢, while in a jobbing way from 12½¢ to 12¾¢ has been made, casting brands meanwhile bringing 10¼¢ @ 10½¢, now offered at 10¼¢. While the uncertainty about the companies' future action continues consumers are trying to get along as well as they can in meeting current requirements. The export of Pyrites from Spain during the first five months has been 412,780 tons, against 341,009 tons last year and 333,431 in 1887. That of Precipitate was 11,792 tons, against 12,026 tons during the corresponding period of last year and 11,696 in 1887.

**Tin.**—At the time of our last week's report Spot Tin stood £89. 7/6; it improved to £89. 17/6 since, while futures rose from £90 to £90. 5/; sales 800 tons. The greater activity and slightly rising tendency in London met with but little response here, dealers and consumers still being amply stocked to meet the moderate wants of the present dull period. Our market was steadier, however, at 19.90¢ spot, and 19.95¢ October, nominally. Messrs. Gilfillan, Wood & Co., Singapore, remark in their semi-monthly review of June 12 that at the time stocks on the spot were nearly exhausted, nor was it believed that much Tin was held back in the native States, while mining operations were by no means going on briskly. Should these views prove correct there may soon be a notable falling off in the Straits shipments, which would lead to some improvement in London and here under the stimulus of a reviving fall demand. It will therefore be advisable to watch the metal and its statistics closely from now forward, the more so as much of the recent decline was no doubt due to the unusually heavy westward exportation from the Straits Settlements. The closing quotation for spot Tin to-day is 19.80¢ @ 20¢. **Tin-Plates.**—While the market on the other side remains very firm, we have an excessively dull one here. Dealers state that the demand has slackened and the importers of Tin-Plates cannot get the cost of importation for their goods. There is no change in quotations. We quote large lines, ordinary brands, ¾ box: Siemens-Martin Steel, Charcoal finish, \$4.75 @ \$5.50; Coke finish, \$4.60 @ \$4.65; Terns, \$4.12 @ \$4.30; Coke Tins, \$4.22½ @ \$4.32½, and Wasters \$4.05 @ \$4.10.

**Lead.**—Sales for the week have been confined to 400 tons Common Domestic in the open market at 3.80¢ @ 3.85¢, which is also the closing quotation. In St. Louis the price is 3.70¢ @ 3.75¢ and at Chicago 3.75¢ @ 3.80¢; at both points the sales are light. The export of Pig-Lead from Spain during the first five months was 53,138 tons, as compared with 53,932 during the corresponding period of last year and 56,051 in 1887.

**Spelter.**—Goes on tending upward. A lot of 150 tons Common Domestic was sold



at 5.10¢, but it cannot now be laid down here from the West for less than 5½¢. Silesian is higher again and must be quoted 6½¢ nominally. Calamine exportation from Spain during the first five months did not exceed 9564 tons, whereas last year it was 11,186 and 14,129 in 1887, showing a steady gradual decrease.

**Antimony.**—While stocks are light, the demand is brisk and we are higher, Cookson's being worth 16½¢ @ 17¢ and Hallett's 15½¢ @ 16¢.

#### New York Metal Exchange

The following sales are reported:

THURSDAY, July 18.	
10 tons Tin, October.....	19.80¢
10 tons Tin, November.....	19.90¢
WEDNESDAY, July 24.	
10 tons Tin, September.....	19.90¢
10 tons Tin, last half of August.....	19.90¢

#### Imports.

##### Hardware, Machinery, &c.

Agostini, Mach'y, cs., 10  
 Almqvist, A. W., Mach'y, cs., 23  
 Barbour Bros. & Co., Mach'y, pkgs., 4  
 Boker, Hermann & Co., Mdse., cs., 12; Arms, cs., 26  
 Baldwin Bros. & Co., Mach'y, cs., 2  
 Curley, J., & Bro., Cutlery, cs., 4  
 Clark, G. A., & Bro., Mach'y, cs., 115  
 Electric Cutlery Company, Mdse., cs., 2  
 Folsom, H. & D., Arms Co., Arms, cs., 4  
 Field, Alfred & Co., Mdse., cs., 20  
 Graef Cutlery Company, Cutlery, cs., 23; Hdw., cs., 3; ditto, ck., 1  
 Lima, D. H. De, & Co., Mach'y, pes., 2  
 Muller, C. G., Mach'y, case, 1  
 Schoverling, Daly & Gales, Arms, cs., 53  
 Stoddard, Lovering & Co., Mach'y, cs., 3  
 Taylor, Thos., Mdse., cs., 6  
 Wiebusch & Hilger, Lim., Mdse., cs., 22  
 Werlemann, H., Arms, cs., 4  
 Witte, John G. & Bro., Cutlery, cs., 7  
 Wittmann Bros., Filling-Machines, cs., 12  
 Order, Mach'y, pkgs., 26

#### Coal Market.

Contrary to expectations, the Anthracite Coal trade is dull and the market weak. The improvement predicted for the middle of July is postponed until the 1st of August. But with this disappointment there is increased confidence that the active season once opened will come with a rush, with more or less embarrassment in the vain effort to fill orders without delay. Respecting prices operators admit that there is very little Coal sold at the latest advance. The Western demand is stimulated by the reduction of 50¢ per ton, in competition with lake routes. Lehigh Broken is in short supply and Reading makes a similar complaint, which is partly due to the conversion of large sizes into others for which there is more demand.

The Philadelphia Record says the condition of trade has been made very apparent by the shut-down of the Lehigh and Wilkesbarre Coal Company. The company may stop operations for a few days only, but it has been customary for all collieries to be working full time at this season of the year. Quotations are, f.o.b.: Free-Burning, Broken, \$3.90; Egg and Chestnut, \$4.15; Stove, \$4.40. Hard White Ash at Port Liberty, \$4.25 for Lump and Steamboat, \$4.05 for Broken and \$4.25 for Egg.

Bituminous Coal is still quoted at pool prices. A telegram from Shamokin, Pa., says that a representative of the Vanderbilts has purchased the interest of a number of heavy local stockholders in the Beech Creek Coal Company. Over \$3,000,000 were involved in the transaction.

A special to the Philadelphia Press says: "The Philadelphia and Reading Coal and Iron Company have just completed at Phoenix Park a large new breaker, and at Good Spring they are erecting two mammoth breakers, which will enable the colliery to ship by September 1. Pardee & Co. are making rapid progress with the open-

ing of their Blackwood Colliery, and will pump out and work the abandoned Dutton slope in the near future. The Glendower Colliery will resume on August 1, after a year's idleness, giving employment to over 500 persons. Merriam Colliery, near Ashland, has resumed work. The Lehigh Valley Coal Company will open up several new collieries on their lately purchased coal lands near Minersville. The Hillside Coal and Iron Company have commenced the introduction of electricity for lighting their Erie Mine and propelling cars on the inside gangways."

Cumberland Coal shipments for the week were 68,004 tons, and for the year 1,575,114, a decrease of 270,800 compared with 1888.

Coke trade prospects are brighter in the Connellsville region.

#### British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, July 24, 1889.

Small shipments from the Straits during the first half of July have imparted greater firmness to the Block-Tin market, and prices show a decided improvement, being not only higher but well supported the past few days. On Thursday last there was 15/ rise, but the higher prices caused realizations, with some pressure to sell forward prompts and free offerings of options, under which a relapse of 20/ took place. The option business has been large during the week, the "bulls" backing their opinions and paying 10/ @ 15/ per ton for "calls" during August on large quantities at prices varying between £89 and £91. The "bear" interest are rather aggressive and by their movements create a division of opinion among operators as to future prices. The statistical position is sound and the consumption is steady. A further advance was paid to-day, sales having been made at £90. 5/ spot, and £90. 15/ futures.

The variations in prices of Merchant-Bar Copper have been moderate. Cash lots continue in fair demand and are not plentiful. During the first half of the week £41 was paid quite freely, but afterward there were sellers of prompts and futures touched £40. 2/6. The apparent undertone of weakness at that time was attributed to suspicions that foreign holders are quietly selling and the same circumstance still has a bearing upon futures.

Tin-Plate has been in quite active demand, and sales were larger than in the preceding week. Several good lines were booked, and additional large orders are pending.

Scotch Pigs have continued active, with the American demand, as well as the inquiry from many other sources, stronger than last week. Prices now show a complete recovery from the June decline. The demand from speculators has been large, and the purchase of one block of 1000 tons Coltness is reported. Cleveland Pig and Hematites are also active at a further advance. Additional furnaces are lighting.

There is an immense trade doing in the Steel department, and some firms have withdrawn quotations, being sold far ahead. Basic Steel has been advanced 10/ all around. About the only exception to the quite general activity is found in Wire-Rods and Billets. Holders of Old Iron Rails have advanced their prices about

2/6, but there are very few buyers at the higher figures.

**Scotch Pig.**—An active business has been done at a further advance in prices for all brands.

No. 1 Coltness, f.o.b. Glasgow.....	57/
No. 1 Summerice, " ".....	55/6
No. 1 Gartsherrie, " ".....	54/6
No. 1 Langloan, " ".....	56/
No. 1 Cambro, " ".....	48/6
No. 1 Shotts, " ".....	54/6
No. 1 Glengarnock, " ".....	53/6
No. 1 Dalmeilington, " ".....	47/
No. 1 Eglinton, " ".....	46/

Steamer freights, Glasgow to New York, 4/; Liverpool to New York, 10/.

**Cleveland Pig.**—Prices are up another 6d and the market active at the advance. No. 3 Middlesborough quoted 40/6, prompt, by makers.

**Bessemer Pig.**—There has been a large business at 6d advance and the market is strong. West Coast brands, mixed numbers, 50/6 @ 50/9, f.o.b. shipping point.

**Spiegeleisen.**—Under continued brisk demand prices are up 2/6 and the market very firm. English 20 % quoted 82/6, f.o.b. at N. W. England shipping point.

**Steel Rails.**—Prices are not changed, but the market is strong and active. Heavy sections quoted at £4. 15/ and light sections £5 @ £5. 5/, f.o.b. at N. W. England shipping point.

**Steel Blooms.**—A fairly active trade in these at firm prices. We quote £4. 7/6 for 7 x 7, f.o.b. at N. W. England shipping point.

**Steel Billets.**—Demand continues good and prices are firm. Bessemer, 2½ x 2½ inch, £4. 12/6, f.o.b. at N. W. England shipping point.

**Steel Slabs.**—The market remains firm, although still rather quiet. Bessemer, £4. 10/, f.o.b. at N. W. England shipping point.

**Old Rails.**—Higher prices are asked, but buyers are doing little. Tees quoted at £3. 7/6 and Double Heads, £3. 15/, c.i.f., New York.

**Scrap-Iron.**—The demand has not been so good, but prices are steady. Heavy Wrought quoted £2. 2/6 @ £2. 5/, f.o.b.

**Crop Ends.**—Sellers very firm, but the demand smaller. Bessemer quoted £2. 12/6 @ £2. 15/, f.o.b.

**Tin-Plate.**—A larger business has been done. Prices not quotably higher, but stronger. We quote, f.o.b. Liverpool:

1C Charcoal, Alloway grade.....	15/3 @ 15/6
1C Bessemer Steel, Coke finish.....	13/6 @ .....
1C Siemens " ".....	13/9 @ .....
1C Coke, B. V. grade.....	13/ @ .....
Charcoal Terne, Dean grade.....	12/ @ 12/3

**Manufactured Iron.**—In this line business has been brisk and the market is very strong. We quote, f. o. b. Liverpool:

	£ s. d.	£ s. d.
Staff, Marked Bars.....	7 0 0	8 10 0
Common " ".....	7 0 0	7 2 6
Staff, Bl'k Sheet, singles.....	8 5 0	8 5 0
Welsh Bars (f.o.b. Wales).....	6 2 6	6 2 6

**Copper.**—A fairly good business. Merchant-Bar futures easier; other kinds firmer. To-day's prices for Bars were £41, spot; £40. 5/, three months' futures. Best Selected, £47.

**Tin.**—A brisk demand and the market firm. Straits quoted at £90. 5/, spot, and £90. 15/ for three months' futures.

**Lead.**—No improvement in the demand. Prices barely steady. Quoted £12. 5/ for Soft Spanish.

**Spelter.**—The market is strong at a still further advance. Quoted at £19 17/6 for ordinary Silesian.





The company are now probably the largest manufacturers in the United States of Earth-Moving Implements, and this catalogue illustrates several additions to this line of goods. Among the new goods their Steel-Bowl Wagon Trucks and Dipping-Tanks may be mentioned, as well as their Railroad-Pattern Steel-Tray Barrow. The whole catalogue is of special interest. The company also issue a separate catalogue representing their line of Store and Railroad Trucks, Depot Baggage, Express and Grain Wagons, &c.

The trade will learn with deep regret of the sudden death of Andrew Carrigan, treasurer of the Dunham, Carrigan & Hayden Company, San Francisco, Cal. He was stricken down with apoplexy on Friday evening, July 5, and passed away within an hour.

Self-Heating Flat-Iron Company, Cleveland, Ohio, issue a circular relating to A. F. Chable's Patent Self-Heating Flat-Irons, the special features of which are referred to and their advantages pointed out.

Announcement is made that Arthur Brittan, Glendy S. Graham and Philip Mathes, under the firm name of Brittan, Graham & Mathes, have purchased the stock and materials of the Nimick & Brittan Mfg. Company, Pittsburgh, Pa., and will continue the manufacture of their well-known line of Door-Locks, Padlocks, Builders' Hardware and Scales. They are now prepared to quote prices and fill orders. Goods can still be ordered from the catalogue of the old company.

Buhl Stamping Company, Detroit, Mich., are putting on the market Kinney's Patent Disinfecting Chamber-Pail or Toilet-Jar and Improved Commode. It is made of galvanized iron with a seat or surface rim of wood. A box-cover forms a receptacle for holding a disinfectant which is deposited in the pail by the movement of a lever.

R. F. Osborn & Co., 751 Market street, San Francisco, Cal., have issued their illustrated catalogue No. 7, showing the very complete line of Cabinet and Upholsterers' Hardware which they are handling, to the display of which nearly 400 pages are devoted. This large and varied line is fully illustrated, with list prices. They also issue a separate catalogue and price-list of Tools for carpenters, upholsterers, cabinet-makers, blacksmiths, paper-hanging, machinists, engravers, &c. This pamphlet of 128 pages represents a desirable selection of these goods, the manufacturers' lists being adhered to as far as possible. The extent of these catalogues and the variety of goods shown in them illustrate the enterprise of the house and the extent of their business.

The Lunkenheimer Brass Mfg. Company, Cincinnati, Ohio, successors to Frederick Lunkenheimer (Cincinnati Brass Works), have issued their first catalogue, a handsome, large-paged pamphlet representing their well-known line of goods. The paper and engravings are especially good. The catalogue shows some improvements in goods hitherto manufactured, as well as the addition of some new articles. It is stated that since the death of Mr. Lunkenheimer the plans conceived by him for increasing the capacity of his manufactory have been carried out and realized, and these, with the improvements the company have added, afford exceptional facilities for the manufacture of their improved line of goods.

Chas. L. Mead, of the Stanley Rule and Level Company, New Britain, Conn., and New York, has just returned from a three-months' trip, visiting the Pacific Coast, Oregon, and the Puget Sound towns, Tacoma, Seattle, Port Townsend, &c.,

thence extending the trip into Alaska as far as Sitka and Glacier Bay, returning by the Northern Pacific.

J. Bardsley, 59 Elm street, New York, announces that hereafter, the Wood Door-Knobs of his make will have the word Bardsley stamped upon their shanks. He has adopted this as a measure of protection against cheap and inferior goods which in many cases have been furnished to buildings for which his goods have been specified.

Johnson Bros., Aurora, Ill., issue a circular describing the Johnson Tire Bolter and Cutter, of which they are manufacturers. This machine is designed for bolting and unbolting vehicle-wheel tires.

The Wire Fabric Company, Homer, N. Y., announce that they have a limited quantity of the best quality of Wire-Cloth of desirable widths and colors for Door and Window Screens which can be obtained for prompt delivery.

Anthony & McElroy, 328 Chestnut street, Philadelphia, have secured the general Eastern sales agency of the Open Hexagonal Turn-Buckles manufactured by the Central Iron and Steel Company, Brazil, Ind.

The copartnership heretofore existing between William D. Lloyd, William W. Supplee, William S. Lloyd and William D. Supplee, under the firm name of Lloyd & Supplee Hardware Company, has been dissolved by limitation. The business of the late firm will be settled at its present address, 503 Market street and 4 and 6 North Fifth street, Philadelphia. The trade is further notified that the Supplee Hardware Company will continue the general Hardware business as successors to the Lloyd & Supplee Hardware Company at the same address as above given.

### Wrought-Iron Pipe.

The regular monthly meeting of the Wrought-Iron Pipe and Boiler-Tube Manufacturers' Association was held in the Oriental Hotel, Manhattan Beach, on Wednesday, the 17th inst. Campbell B. Herron, chairman of the association, presided, and J. B. Murdock acted as secretary. The following-named firms were represented in person:

National Tube Works Co., Pittsburgh.  
Pennsylvania Tube Co., Pittsburgh.  
Spang, Chalfant & Co., Pittsburgh.  
A. M. Byers & Co., Pittsburgh.  
Duquesne Tube Co., Pittsburgh.  
Morris, Tasker & Co., Philadelphia.  
Conshohocken Tube Co., Conshohocken, Pa.  
Am. Tube and Iron Co., Middletown, Pa.  
Oil City Tube Co., Oil City, Pa.  
Riverside Iron Works, Wheeling, W. Va.  
Allison Mfg. Co., Philadelphia.

Reports from the members showed that the business was in good condition, with an excellent demand. After considerable discussion it was decided to make a general advance in all sizes. The following discounts and prices were agreed upon and went into effect on Saturday, the 20th inst.:

	Discount
Butt-Welded Pipe.....	50%
Lap " " ".....	62½%
Butt " " (Galvanized).....	41½%
Lap " " ".....	50%
Casings, 5½ inches.....	60%
All other sizes.....	57½%
Boiler Tubes, 1¼ inches and smaller.....	52½%
" " " " " larger.....	57½%
	Per foot, net.
2½-inch Line-Pipe.....	\$0.17
3 " " ".....	0.22
3½ " " ".....	0.27
4 " " ".....	0.32
5 " " ".....	0.40
6 " " ".....	0.62
7 " " ".....	0.76
8 " " ".....	1.04
9 " " ".....	1.30
10 " " ".....	1.35
11 " " ".....	1.75

The next meeting of the association will be held about the middle of August.

### Trade Topics.

Fort Worth, Texas, is evidently coming into increased prominence as a Hardware market, and our reports indicate that there has been of late a continued steady increase in its business. The advantages it possesses are referred to in the following communication:

The very location of Fort Worth indicates it as being a distributing point of no little importance, there being no other towns of great consequence until Denver is reached, over 700 miles away, and west, El Paso, which is over 600 miles distant, leaves a clear field for this city to distribute her goods over. The Pan-Handle country, recently opened up by the passage of the Fort Worth and Denver Railroad, is assuming wonderful development. Towns are springing up everywhere and lands are advancing in price, and as it takes Hardware and a great deal of it to supply the demands you can readily see that a big traffic is done on this line.

In connection with the dissatisfaction which prevails in different parts of the country on account of the operation or administration of the Interstate law, it is to be noted that complaint on this score comes also from Texas, and the wholesale merchants there, including many of the Hardware jobbers, especially those in the interior, regard it as a great obstacle to the development of their trade. The excessive local freight rates are the ground of complaint. This state of affairs has existed only since the Interstate Commerce law went into effect, and the merchants are taking active measures for the correction of the evil. These are referred to in the following remarks of a correspondent in that State:

I need not say that there is a decided feeling crystallizing against the results of the law in this State. There is a feeling prevalent among the jobbers that unless rates to local points are materially lessened the tendency will be to drive wholesale houses out of the business. On the 8th of this month a convention of business men of the State was held in Dallas for the purpose of looking after freight rates. After a two-days' session a committee of one from each of the 31 Senatorial districts in the State was appointed to convene in Dallas, August 15, to confer with the authorities of the various railroads coming into the State and to endeavor to induce them to grant the people of Texas reasonable freight rates. In case no satisfactory results are obtained it was further resolved that a convention be called in each of the Senatorial districts and petitions be sent to the Governor calling for an extra session of the Legislature to take steps toward the creation of a railroad commission.

The question as to the most advantageous form and size of Cut Nails is not a simple one, and the apparent crudeness of some of the Nails is made the more striking by the introduction of the Wire Nails, with their different gauges. On this point a correspondent, referring to the movement which is reported to be on foot to have Nails cut finer, says:

No doubt such Nails would answer all right in sections where soft pine is used principally, but in this section they would not. The Finishing Nail as now made by Western manufacturers is too slender for our pine lumber and the common Nails not overstout. We think rod should be the base size, being the principal size used.

The bright side of the calamities which resulted from the Pennsylvania floods has been the manner in which in all parts of the country relief funds were raised, with manifestations of sincerest sympathy. In a less public way there were many tenders of substantial assistance, and we happen to hear of not a few instances in which the creditors of those who were unfortunate

have shown a very creditable indulgence, while in some instances there was a willingness to remit the entire amount of the indebtedness which it was not in the power of the merchant to discharge. We have, however, received from F. H. Keller & Co., Williamsport, Pa., a letter indicating an entirely different spirit, and one which in its coarse brutality it would, we believe, be difficult to parallel in business correspondence. This letter we print below. The Oval Churn Company, the writers of the letter in question, had sent to F. H. Keller & Co. a 90-day note waiving stay of execution and exemption laws, with 6 per cent, added for collection if not paid at maturity. The note was returned unsigned by F. H. Keller & Co., stating that they would pay all their creditors in full, but requesting an extension of time. The reply received by them was as follows:

THE OVAL CHURN COMPANY,  
GOSHEN, IND., July 1, 1889.

F. H. KELLER & Co., Williamsport, Pa.—Dear "Gentlemen:" Your "esteemed" favor of the 26th at hand. We make draft on you to-day at three days' sight for the amount you are owing us, and if not paid we will sue it, just so sure as you live. What an absolute, perfect set of thoroughbred asses you must be, and what a shame it is that you are not resting among the lost on the bottom of the Susquehanna. Respectfully,

THE OVAL CHURN COMPANY.

An esteemed Western correspondent sends us the following notes:

During a visit to Chicago I found the wholesale Hardware trade in a prospective prosperous condition, while present business is up to expectations for this time of the year. A. C. Bartlett, of Hibbard, Spencer, Bartlett & Co., has just returned from Europe—a trip combining business as well as pleasure, though the latter was the most prominent object in view. He reports himself in excellent working condition. James M. Horton, of Horton, Gilmore, McWilliams & Co., spoke very encouragingly of the prospects of fall trade in the West. As an evidence of their faith in large crops and other favorable indications in this direction a full force of traveling men will represent them in the territory usually covered by them. Stocks are low in wholesale hands, as summer goods are sold and fall and winter goods have not arrived to fill the vacancy. We understand that stocks will be up to, or in excess of, all expected demands upon them. Some of the principals as well as a large number of the lesser lights are away at present enjoying their vacations. The northern lakes seem to be growing in favor as resorts each year, although the sea-shore has attractions for many to whom a vacation without a sniff of salt air would seem no outing at all.

In the following letter we are advised by Chas. P. Strong, a well-known Hardware man of New Brunswick, N. J., in regard to an annoyance to which he has for several years been subjected. It may be that others have had similar experience, and it is but just to the trade that they should be on their guard against such imposition:

We have been greatly annoyed for several years, and especially within the past three years, by certain parties using our name in New York City to purchase goods at wholesale rates for their own use or for certain parties who employ them to buy articles for their use and making their profit by this means, paying for the goods on delivery, so as to avoid our becoming acquainted with the transaction, the houses from whom they purchase believing the goods are for us. By accident we once in a while learn of the fact. For example: A Chambers-street house with whom we deal recently sent us a statement of account which we knew nothing about, and on asking for bill of items or an explanation we found the parties had used our name and had paid for the goods and by some mistake a statement was sent to us. It will thus be seen that any criminal act is avoided by which we could

prosecute the parties, as they will always pay for the goods at the time of purchase.

Corbett, Failing & Co., Portland, Ore., have issued the new card on Standard Wire Nails in the following convenient form:

Wire Nail Classification.—Advances Over Base Price.

Size.	2	3	4-5	6-7	8-9	10	12-16	20	30-40	50	60
Common, Fence, Shingle, Floor- ing and Common Brad.....	\$2.00	\$1.50	\$0.90	\$0.65	\$0.50	\$0.40	\$0.35	\$0.30	\$0.20	\$0.10	Base
Barbed Common & Barbed Car..	2.25	1.75	1.15	.90	.75	.65	.60	.55	.45	.35	\$0.25
Casing and Smooth Box .....	2.25	1.75	1.50	1.25	1.00	.90	.80	.70	.60	.....	.....
Barbed Box .....	2.50	2.00	1.75	1.50	1.25	1.15	1.05	.95	.85	.....	.....
Smooth Finishing.....	2.50	2.00	1.75	1.50	1.25	1.00	.90	.80	.....	.....	.....
Barbed Finishing.....	2.75	2.25	2.00	1.75	1.50	1.25	1.15	1.05	.....	.....	.....
Fine Nails.....	2.50	2.00	1.75	.....	.....	.....	.....	.....	.....	.....	.....
Clinch.....	3.00	2.00	1.50	1.00	.90	.75	.60	.50	.....	.....	.....
Length, inches.....	$\frac{3}{4}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	.....	.....	.....	.....
Barbed Roofing.....	\$3.00	\$2.50	\$2.00	\$1.50	\$1.25	\$1.00	\$0.90	.....	.....	.....	.....

Wire Spikes,  
all sizes, 50¢.

The back of the card contains a form for quotation of Wire Nails with a blank for the base price. Referring to their adoption of the new card, they say:

The Hardware trade here adopted the new classification almost immediately, so far as applies to keg goods. On shelf goods there is no agreement. There has thus far been no trouble with the interior, but our young men may find a little. We find on the whole the sooner we on the coast adopt new lists and classifications the better, as our customers are apt to draw conclusions not to our advantage if we maintain old lists after the Chicago jobbers have adopted the new.

#### Exports.

PER SHIP CANARA, JUNE 26, 1889, FOR SIDNEY,  
N. S. W.

By Simpson, Hall, Miller & Co.—24 packages Plated-Ware.

By Singer Mfg. Company.—1264 cases Sewing-Machines, 303 gallons Sewing-Machine Oil.

By A. Ginterman & Co.—1 case Paper Caps, 5 cases Castings.

By W. Lupton.—20 cases Axes, 2 cases Hardware, 1 case Toys.

By Woodhouse & Stortz.—3745 pounds Hardware, 4 dozen Edge Tools.

By R. W. Forbes & Son.—3 cases Wash-Stands, 4 packages Horse-Rakes, 143 packages Sewing-Machines, 2 cases Horse-Hoes, 2 cases Hardware.

By W. K. Freeman.—409 pounds Hardware, 1 case Hardware, 2476 pounds Axes, 44 cases Handles, 2350 pounds Tackle Blocks, 30 Corn-Mills, 18 Trucks.

By H. W. Peabody & Co.—4 bales Hammocks, 1 case Hardware, 2 cases Mill Machinery.

By Healy & Earl.—1 box Scroll-Saws, 2 Engines and Parts, 5 packages Blowers, 4 packages Pumps, 20 packages Pumps, 1 box Emery-Wheels, 1 box Emery-Wheels, 1 box Emery Machinery, 1 box Knife-Sharpener, 1 box Rope Pulley-Blocks, 2 boxes Saws, 8 boxes Wood-Working Machinery, 1 case Saws, 4 cases Hardware.

By Morris, Strouse & Co.—120 dozen Axe Handles, 12 dozen Lemon-Squeezers, 60 dozen Carpenters' Tools, 5 gross Toys.

By Strong & Trounbridge.—6 cases Tools, 1 case Hammers, 2 bundles Bows, 3 cases Castings, 2 cases Screws, 3 cases Pumps, 1 case Tools, 2 cases Hardware, 1 case Locks, &c., 1 case Chucks, 2 cases Carriage Trimmings, 12 cases Axes, 1 case Levers, 4 cases Nails, 1 case Corn-Mills, 1 case Chaff-Cutters.

By Coombs, Crosby & Eddy.—28 dozen Axes, 100 dozen Wood Handles, 8 dozen Hardware, 30 dozen Hoes, 4 dozen Lanterns, 3 dozen Carpenters' Tools, 263 pounds Blocks, 8 $\frac{1}{2}$  gross Hardware, 30 gross Wicks, 62 Stoves, 17 dozen Agricultural Tools, 12 gross Fruit-Jars, 200 dozen Fruit-Jars, 5 $\frac{1}{2}$  gross Wood Spoons, 1000 Broom Handles, 24 Stoves, 24 dozen Hatchets, 3 dozen Cages, 65 dozen Carpenters' Tools, 16 dozen Stoves, 115 dozen Saws, 5 dozen Wringers, 2 dozen Carpet-Sweepers, 55 dozen Hardware, 126 Velocipedes, 30 Ice-Cream Freezers, 3 dozen Bench-Screws, 6 dozen Wash-Boards, 33 dozen Carpenters' Tools, 200 gross House-Furnishing Goods, 18 dozen Hammers, 9 dozen Wrenches, 13 dozen Hoes, 3 dozen Bench-Screws, 336 pounds Stones.

By Itsey, Doubleday & Co.—6 $\frac{1}{4}$  gross Axle-Grease, 20 dozen Brooms, 12 $\frac{1}{2}$  gross Axle-Grease, 560 pounds Pumice-Stone, 12 $\frac{1}{2}$  gross Axle-Grease, 4 dozen Brushes, 5 dozen

Brushes, 6 cases Glue, 4 dozen Brushes, 12 dozen Brushes, 320 pounds Castings, 2 boxes Castings, 1 gross Barometers.

By Arkell & Douglas.—5 cases Handles, 30 boxes Shade-Rollers, 3 cases Ladders, 11 cases Hardware, 1 case Carriage-Ware, 2 cases Hardware, 6 cases Tools, 16 cases Axes, 1

case Wagon-Jacks, 50,000 Cartridges, 36 sets Tools, 2 cases Guns, 10,000 Cartridges, 50,000 Primers, 12 cases Tools, 38 packages Hardware, 200 boxes Clothes-Pins, 22 packages Hardware, 11 cases Tools, 10 crates Refrigerators, 17 packages Hardware, 2 cases Tools, 5 cases Castings, 1 case Sand-Paper, 2 cases Bolts, 33 packages Hardware, 18 packages Tools, 2 cases Carriage-Ware, 7 cases Cartridges.

By V. Basanta.—6 dozen Wrenches, 400 dozen Handles, 1000 Broom-Handles, 104 dozen Wash-Boards, 54 dozen Whisk-Brooms, 1 dozen Lanterns, 4 dozen Toy Pistols, 1 dozen Air-Guns, 20 Velocipedes, 42 Bird-Cages, &c., 13 Clocks, 54 Velocipedes, 2 dozen Wagons, 21 dozen Brushes, 30 dozen Saw Tools, 278 dozen School Slates, 15 dozen Axes, 18 Pistols, 36 dozen Handles, 1000 Broom-Handles, 2 gross Hammock Ropes, &c., 4 dozen Meat-Choppers, 2 gross Toy Pistols, 20 gross School Crayons, 7 cases E. P. Ware, 2400 pounds Bolts, 40 boxes Tacks, 224 pounds Nails, 24 dozen Locks, 6 dozen Twine-Boxes, 29 dozen Lamp Goods, 100 dozen Burners, 56 $\frac{1}{2}$  dozen Lamp Goods, 1 Carriage, 60 Velocipedes, 82 dozen Keys and Blanks, 1-6 dozen Keys and Blanks.

By McLean Bros. & Rigby.—12 dozen Axes, 6 dozen Hammers, 12 dozen Braces, 2 dozen Plumbs and Levels, 3 packages Hardware, 7 dozen Locks, 2 Boring-Machines, 17,000 Bolts, 2 $\frac{1}{2}$  dozen Casters, 4 dozen Clocks, 2 packages Plated-Ware, 1 dozen Churns, 2 $\frac{1}{2}$  gross Fruit-Jars, 2 Stoves, 10 dozen Saws, 120 dozen Handles, 1 box Iron Nails, 18 dozen Wash-Boards, 18 dozen Burners, 3 gross Shade-Rollers, 20 dozen Saws, 1 5-6 gross Fruit-Jars, 144 dozen Handles, 1 dozen Wringers, 6 dozen Axes, 12 dozen Handles, 3500 Handles, 24 dozen Axes, 5 packages Hardware, 2 cases Harvesting-Machine Parts, 6 Wind-Mills, 36 Carriages, 6 Lamps, 17 dozen Plumbs and Levels, 4 gross Lemon-Squeezers, 36 Corn-Mills, 2 cases Hardware, 15 sets Axes, 36 dozen Lamp-Chimneys, 71 dozen Saws, 46 packages Carriage-Ware, 200 pounds Finishing Nails, 8000 Bolts, 6 dozen Hoes, 3 cases Hardware, 8 dozen Braces, 1 gross Razors, 1 $\frac{1}{2}$  gross Whip-Handles, 20 dozen Wash-Boards, 100 gross Clothes-Pins, 6 Hammock Chairs, 5 gross Shade-Rollers, 1 gross Can-Openers, 3 dozen Saw-Sets, 7 dozen Meat-Choppers, 17 dozen Thermometers, 6 dozen Curry-Combs, 224 pounds Whetstones, 12 dozen Wash-Boards, 3 cases Hardware, 6 cases Iron Nails, 20 dozen Axes, 14 dozen Saws, 7 cases Wire Goods, 11 cases Locks, &c., 2500 Handles, 4 cases Hardware, 3 cases Wire Goods, 28 dozen Axes, 5 dozen Braces, 3 dozen Drills, 16 cases Agate-Ware, 3 dozen Plumbs and Levels, 13 dozen Locks, 28 Pumps, 70 pounds Rivets, 5 dozen Axes, 11 dozen Hoes, 6 dozen Meat-Choppers, 11 gross Shade-Rollers, 1 gross Razors.

By R. W. Cameron & Co.—6 boxes Buggies, 310 dozen Handles, 840 dozen Handles, 50 boxes Lamps, 2 boxes Hardware, 2 crates Wheels, 96 cases Handles, 141 sets Axes, 20,000 Bolts, 7 boxes Gearing, 9 boxes Saws, 30 Guns, 20,000 Metallic Cartridges, 1 box Primers, 10 packages Hardware, 18 Pumps, 38 boxes Lanterns, 1 box Lamp-Ware, 18 boxes Handles, 19 boxes Tools, 5 boxes Axes, 9 boxes Axes and Hatchets, 3 boxes Bush Hooks, 1 box Forks, 12 boxes Hardware, 1 package Locks, 1 crate Trucks, 3 boxes Hardware, 1 barrel Hoes, 2 cases Rat Traps, 1 case Wicks, 1 case Hammers, 2 bales Rubber Hose, 1 box Hardware, 22 Driving-Wheels, 32 cases Brake Fixtures, 1 case Whip Handles, 591 pounds Glue, 6 cases Machinery, 100 tons Iron.

By Rogers, Smith & Co.—2 boxes Plated-Ware.



## Arrangement of Stores.

The accompanying engravings, Figs. 349 to 371, relate to the Hardware establishment of John W. S. Pierson & Co., Stanton, Mich., to whom we are indebted for descriptive particulars concerning it. They give, it will be perceived, a pretty clear idea of the general arrangement of the

and 14 feet 4 inches in height. It is lighted in front by two large plate-glass windows and in the rear, which is supported by iron columns, by a full-sized glass store front. By reference to the floor plan it will be observed that the office occupies the place usually devoted to an outside stairway. The office is 18 feet long, 8 feet wide at the entrance, narrowing to 4½

represented in Fig. 369. The office is finished in black ash and cherry, a part of the office ceiling being shown in Fig. 367. It is furnished not only with a large safe and desks, but also with two cases provided with heavy double casters, which contain drawers for holding circulars and price-lists. Under the letter-press is another case of drawers containing the office

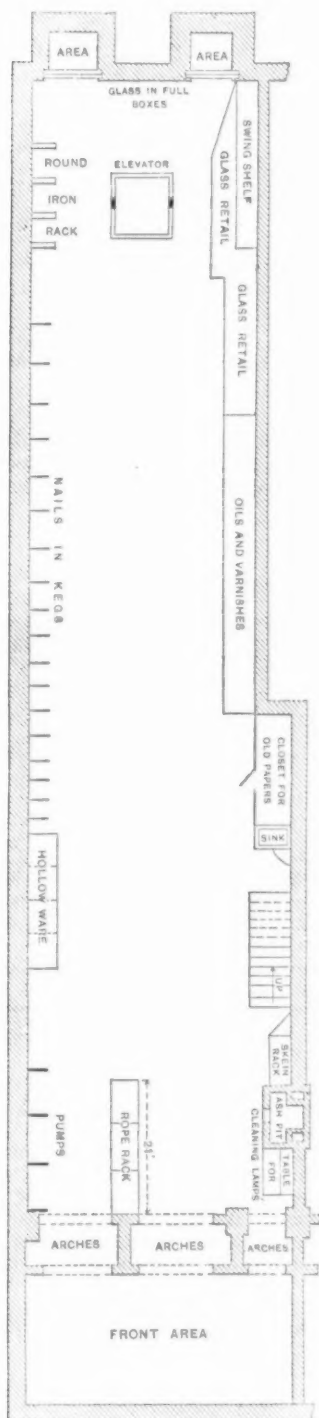


Fig. 349.—Basement.

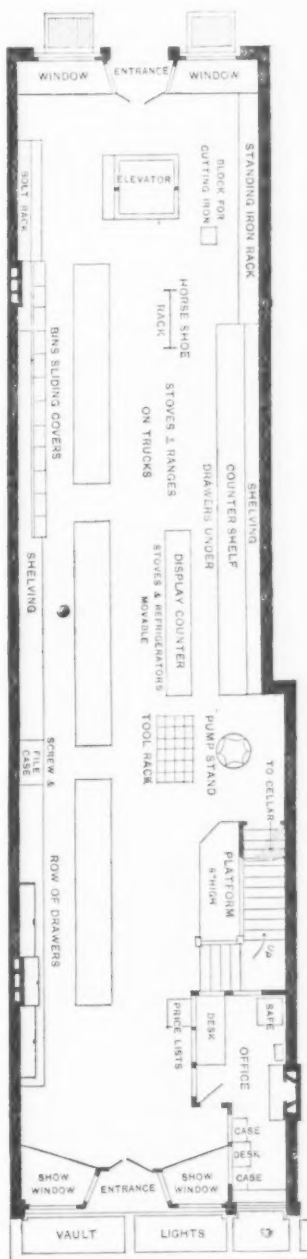


Fig. 350.—First Floor.

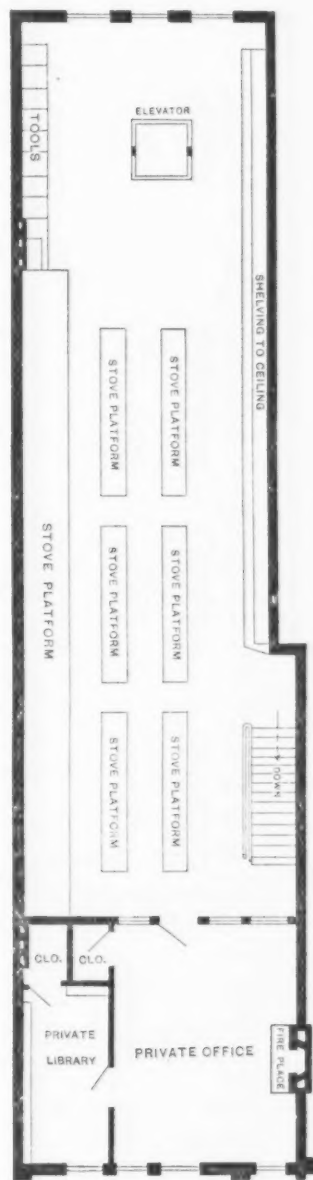


Fig. 351.—Second Floor.

Hardware Store of John W. S. Pierson & Co., Stanton, Mich.—Floor Plans.—Scale 1-16 Inch to the Foot.—Watkins & Arnold, Architects, Detroit, Mich.

store and illustrate also some of the methods adopted in handling certain lines of goods. The store is two stories in height and rests upon a strong foundation, capable of sustaining an edifice six stories high. The front is constructed of red Philadelphia brick, with rock-faced gray Ohio stone trimmings, and is supported by steel girders instead of iron columns. The main salesroom, the plan of which is shown in Fig. 350, is 97 feet long, 23 feet wide in front and 21 feet wide in the rear

feet at the window in front, which is between two pilasters, and 7 feet 4 inches by 3 feet 4 inches, with a transom above. The sash partitions of plate-glass extending to the ceiling on two sides of the office afford to any one within a complete view of the salesroom. An idea of the appearance of these partitions may be gained from Fig. 354. The office is provided with an artistic fire-place of Philadelphia red brick with a mantel of Lake Superior stone, both of which with chimney are

stationery, and upon the safe there is still another case for holding books, catalogues, letter-files, &c. The latter is represented in Fig. 368. This case contains ten compartments, which are used as follows: 1. *Iron Age* and other current prices 2. Bound Hardware and other catalogues not over 11 inches high. Also counting-house dictionary. 3. Larger Hardware catalogues not over 15½ inches high. 4. Invoice-books and Hardware-books. 5. Filing-cases for letters and trade circulars. All

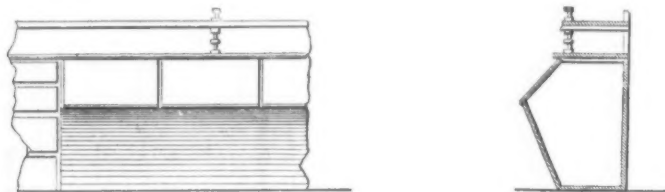
of these compartments being 28 inches will allow double rows of books excepting the wide Lock-books. Nos. 6, 7 and 8, at the top of upper section of case, are for Hardware lists not daily used. No. 9 is used for ledgers, day-books and all other books used during the year, which are necessary to refer to and are not kept in safe. Compartment 10 is devoted to Hard-

ware catalogues. We are advised that this case is compact and easily reached, and avoids making top of safe a receptacle for everything that happens to be laid upon it. By using steps this case could be extended higher and the extra room used to advantage.

The front right-hand show-window of the main salesroom has two panels, each

7 to 2 inches and 4 feet high. This box is used for exhibiting new goods. Here, too, is a shelf  $4\frac{1}{2}$  feet long and 14 inches wide, and supported by spindles 14 inches high. Above this,  $6\frac{1}{2}$  feet from the floor and extending to the show-window, is a strip with wooden pins for suspending goods. Commencing on the left-hand side of the salesroom, there are three large

has beveled sides for tools and wooden pins for Hand-Saws and Squares. All the cases are lined with green glazed paper.



Figs. 352 and 353.—Elevation and Section of Bins with Lids Used Under a Portion of the Shelving.

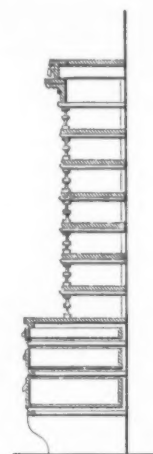


Fig. 357.—Section of Shelving, Showing Drawers.

Under case No. 3 are two closets with shelves for keeping surplus stock of Silver-Ware and Cutlery. In Figs. 359

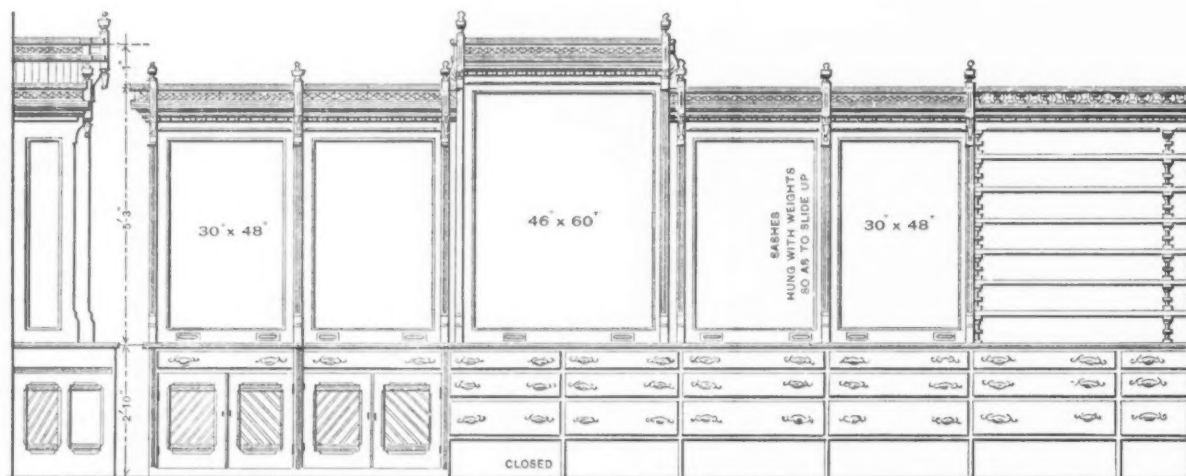


Fig. 354.—Elevation of Cases and Shelving.—Scale,  $\frac{1}{4}$  Inch to the Foot.

22 x 48 inches, made of  $\frac{1}{4}$ -inch pine covered with colored glazed paper and screwed in place. On these are displayed seasonable goods. In the left window there is

shelves, each 8 inches wide and supported by brackets. The base inside the case is 4 inches high in front and 8 inches at the back, with a drop in the center, and contains four drawers 13 x 10 inches, and  $1\frac{1}{4}$  inches deep, and is used for small articles such as Gauge-Glasses and small Brass Fittings. The shelves of this case are

and 360 details of cornice and finish above cases are presented.

Next along this side of the store and extending to the Bolt rack is 53 feet of shelving for the accommodation of Shelf Hardware. A section of this shelving showing drawers is presented in Fig. 357, while in Fig. 354 a front view is shown,

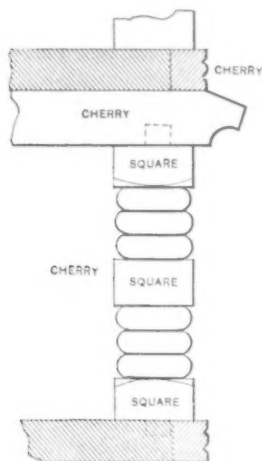


Fig. 355.—Detail of Columns of Shelving.

a box inclining in two directions, 28 inches in depth and tapering from 6 to 3 inches, for displaying tools. On the side wall there is another box tapering from

equally divided; one side is used for Brass Fittings and the other for Table Cutlery. Case No. 2 is  $5\frac{1}{2}$  feet high, 12 inches deep, with a base 4 inches high. It has three shelves, each 9 inches wide, resting on brackets, and is used for displaying Silver and Nickel Ware. Case No. 3 is similar in size to No. 1, but without shelves. It

Fig. 355 also illustrates in detail a column of the shelving. There are seven rows of shelves 7 inches apart and 16 inches deep, supported by cherry spindles. These are supplied with the S. H. Green boxes,  $4\frac{1}{2}$ ,  $5\frac{1}{2}$ ,  $7\frac{1}{2}$ , 9 and  $11\frac{1}{2}$  inches wide, which are found to answer well for the different lines of goods. They are covered with

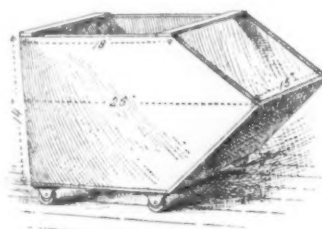


Fig. 356.—Nail Bin.

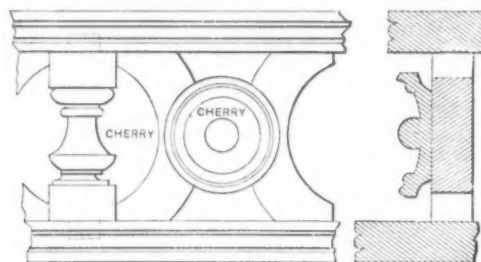


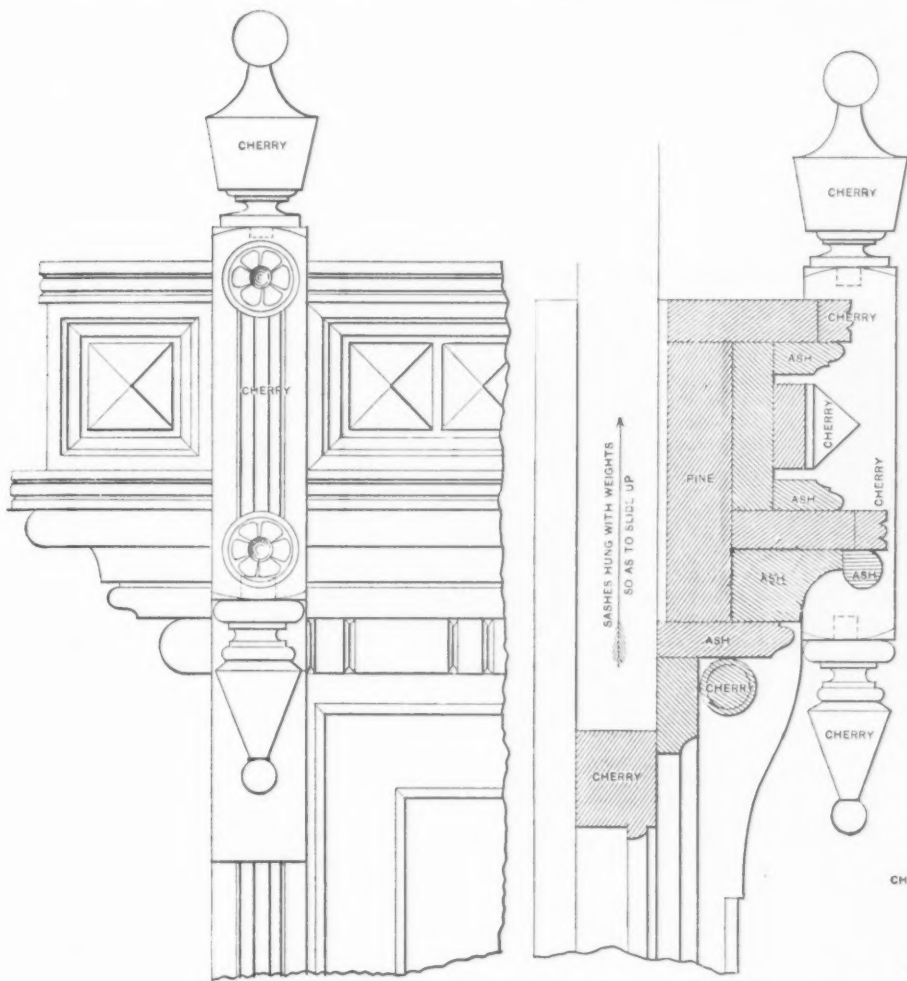
Fig. 358.—Cornice Above Shelving.



green paper and are neatly sampled. The shelving not being adjustable, the boxes may be changed from one shelf to another and easily fitted. The finish of the

the fact that it is not meddled with and the Screws are less likely to become mixed. The File case, which is beside the Screw case, is 5 feet long, 16 inches

as shown in Fig. 357. This allows space for the feet in reaching goods on the top shelf, and also provides a space under the lower drawers for surplus goods or for heavy articles, such as Mattocks and Picks, thus relieving the drawers of too much weight. Adjoining the drawers and under the shelving, as shown in the



Figs. 359 and 360.—Details of Cornice and Finish Above Cases.—Scale, 2 Inches to the Foot.

cornice above this shelving is shown in Fig. 358.

As indicated in the floor plan, there are in the shelving two cases, one for Screws and the other for Files. The

deep at the top and 24 inches deep at the bottom, and contains 39 apartments, each 4 inches wide and 3½ inches high.

The counter-shelf extending under the shelving is 34 inches high and contains 14

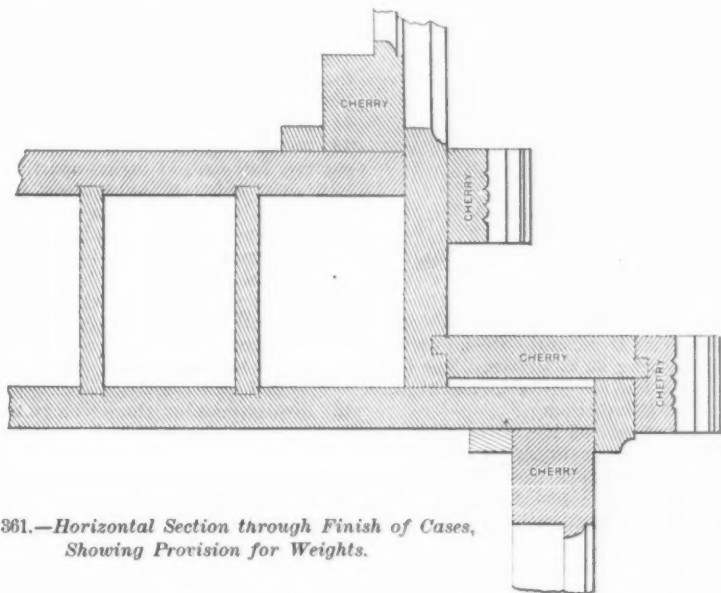


Fig. 361.—Horizontal Section through Finish of Cases, Showing Provision for Weights.

Screw case is 60 x 19 inches, with 90 drawers made of tin, each 3½ inches wide, 2½ inches deep and 11½ inches long. This arrangement, we are advised, is preferred to the patent revolving cases, from

tiers of drawers, three in each tier, each 33 x 22 inches on the inside, and respectively 3½, 5½ and 7½ inches high. There is a base at the bottom 9 inches high beveled back at bottom 4 inches,

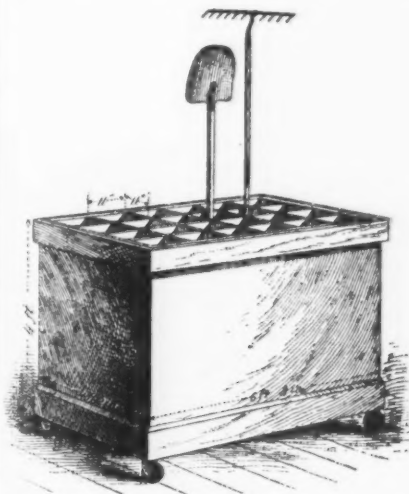


Fig. 362.—Movable Rack for Shovels, Hoes, Rakes, &c.

plan, are 12 bins, beveled front, with sliding cover, each 24 inches wide, 24 inches deep, 23 inches high at the front and 32 inches at the back. Elevation and section of these bins are presented in Figs. 352 and 353. They are used for Twine, Dry

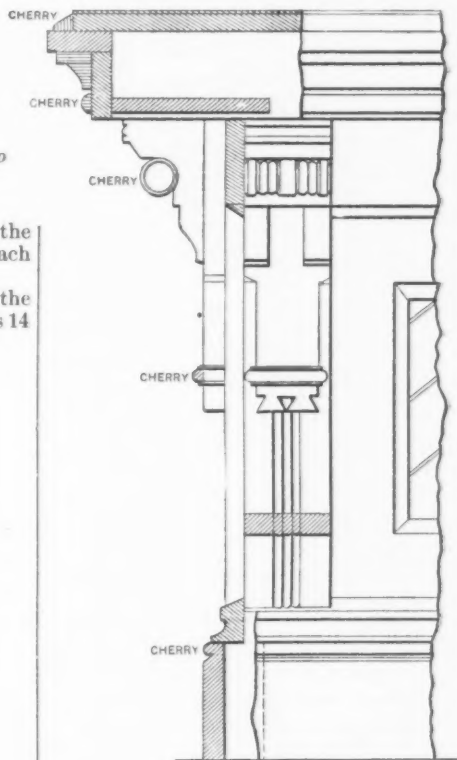


Fig. 363.—Sectional Elevation of Counter.—Scale, ¾ Inch to the Foot.

Paint, Calcimine and Stucco. At the end of the shelving there is a space 5 x 4½ feet devoted to 42 wooden drawers, each 10 x 12 inches and 6 inches deep. These are used for Dry Paint, small Malleable-Iron and Cold Sheets. The contents of all the bins and drawers are plainly lettered.

The Bolt rack, which comes next on this side of the salesroom, is arranged

with drawers of galvanized iron as follows: Five rows of drawers, 22 in each row, 110 in all, each  $3\frac{1}{2}$  inches deep, 5 inches wide and 15 inches long; 5 rows, 16 in each row, 80 in all, each 5 inches deep, 7 inches wide and 15 inches long. Below the counter-shelf there are three rows of apartments, 12 in each row, 36 in all. Each apartment is  $8\frac{1}{2}$  inches deep, 9 inches wide and 24 inches long. They are used for Bolts from 12 to 24 inches and too heavy for the drawers.

The floor plan indicates three counters. The first is 19 feet by 32 inches and 34 inches high, with closed front, and four

and 16 inches deep, with four divisions, for Clevises and Whiffletree Irons. Above each Nail bin the size of the Nails is plainly lettered. At the lower end of the third counter is the shipping-desk, which is not shown in the plan. It is 28 x 30 inches and 12 inches high from the counter in front and 9 inches at the back. Adjacent to this is the elevator, running from the basement to the second floor. At the left of the elevator, as shown in the engraving, is a case for Nuts, Washers and Malleable Iron.

In the rear on the right-hand side of the salesroom there is space for standing

Saw rack corresponds in finish with shelving. It is 8 feet 2 inches high and has five divisions 7 feet long by 5 inches wide and 16 inches deep. Drawer at the base for Saw-Handles is 25 x  $18\frac{1}{2}$  inches and 6 inches deep. The Horseshoe rack in rear of store is represented in Fig. 371. Its arrangement and adaptability for the purpose for which it is designed are obvious. The portable Tool rack which is shown in the floor plan is mounted on casters, is 6 feet 3 inches by 4 feet 2 inches and is 4 feet in height. It contains 24 divisions, each 11 x 11 inches, inside boxed, each partition being full height. The partitions are made

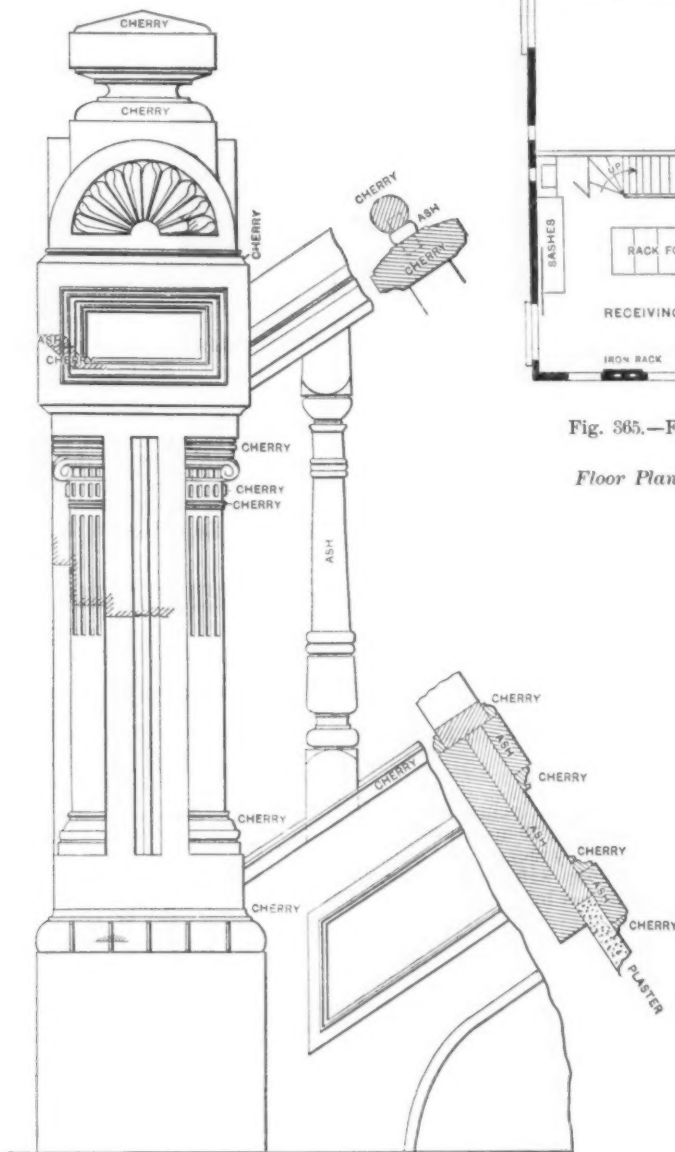


Fig. 364.—Finish of Stairway Leading to Second Floor of Store.—Scale,  $1\frac{1}{2}$  Inches to the Foot.

divisions on the back side, with beveled base 10 inches high, to allow room for the feet in standing close to the counter. The second counter is 19½ feet long and contains 12 Nail carts. One of these Nail carts is shown in Fig. 356. The utility of these carts is obvious. Back of counter is closed to the height of 20 inches and beveled in 4 inches. Above this there are 12 spaces 10 inches high, 16 inches wide and 22 inches deep. Here are kept Barn-Door Hangers and Grindstone Fixtures. The third counter is 19½ feet long. It has also 12 Nail carts. The back is divided in the same manner as the second counter, only six open spaces are used for Strap and T Hinges. Six spaces have drawers made full size  $14\frac{1}{2}$  inches wide

up short Bar Iron and Steel, with a block for cutting it, as shown. The platform of the Iron rack is 4 inches high, 2 feet wide and 20 feet long.

At the front end of the Iron rack the Tin-Ware shelving commences, extending 32 feet to the Saw rack, the height, including cornice, being 8 feet 2 inches. The shelves are 16 inches wide and divided into eight sections, each 40 inches long. Each section contains four shelves 11 inches apart and one shelf at the top  $7\frac{1}{2}$  inches. These shelves are supported by strong spindles. The counter-shelf is 36 inches wide and 34 inches high, and has eight drawers, each 24 x 39 inches and 5 inches deep, making below eight spaces 20 x 41 inches and 36 inches deep. The

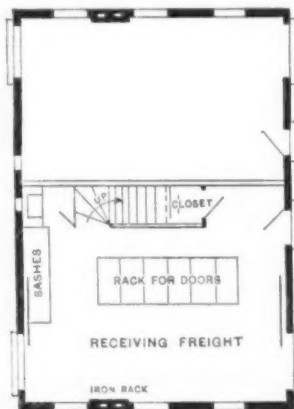


Fig. 365.—First Floor.

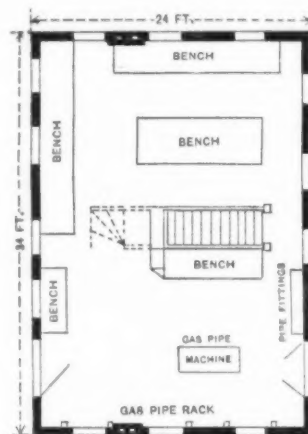


Fig. 366.—Second Floor.

Floor Plans of Tin-Shop.—Scale, 1-16 Inch to the Foot.

of  $\frac{1}{2}$ -inch stuff framed into  $1\frac{1}{2}$ -inch stuff at top. Outside rim is  $2\frac{1}{2}$  inches wide, band at top is 6 inches wide and base 7 inches wide. The rack is made of ash outside and pine inside. This rack is found well adapted for Forks, Hoes, Rakes and Handles, and keeps this class of Tools in compact shape. Fig. 362 represents a movable rack for Shovels, Hoes, Rakes, &c. This rack is mounted on casters and may be readily moved from place to place. The goods are well taken care of and a neat display made. On the right side of the Tool rack is a stand for Pumps, while directly behind this rack, as indicated in the plan, is the display counter, which is 15 feet long, 30 inches wide and 32 inches high. This counter contains four divisions for keeping Hose, Ice-Cream Freezers and Wooden-Ware. It has a base 3 inches high.

Outside the office and near the stair-way there is a desk, marked price-lists in the plan. It is of cherry, the top being 23 x 44 inches, back 45 inches high and front 44 inches. The desk contains three shelves, full size, 11 inches apart, the bottom shelf being 8 inches from the floor. We are advised that this desk has been found convenient for keeping price-books and advertising matter for distribution among customers.

On each side of the salesroom, and running its full length, there is a strip of ash 8 inches from the ceiling, with heavy iron hooks, for hanging Forks, Shovels, Scale-Beams and other articles. Directly over the display counter there is a frame of  $\frac{1}{2}$ -inch gas-pipe fastened to the ceiling with plates. This frame is 20 feet in length and has 6 feet drop, having two center-pieces and three cross-bars, the lower 2 feet 2 inches apart and the upper one 18 inches and 6 inches from the ceiling. This, including the lower bar, will hold 75 Bird-Cages. In the center of the ceiling and over the main passage-way there is a gas-pipe 40 feet in length, with a drop of 10 inches from the ceiling, for hanging Tin-Ware and Lanterns. There is also a piece of gas-pipe on the ceiling in front of the office. The use of this pipe thus ob-



viates the necessity of fastening hooks into the ceiling, which is pine finished in hard oil. The entire wood-work of the store is of black ash and cherry in light hard oil finish. The floor is maple, laid in narrow strips, the joist being crowned, which gives solidity to the floor, which is never depressed by heavy weights. On the outside of the sash partition of the office and at the base of each lower glass is a window-sill 4 inches wide, which is well adapted for displaying small articles in Brass Goods or small cans of Paint or Powder. At the rear corner and above the first stair landing, which is 42 inches above the floor of

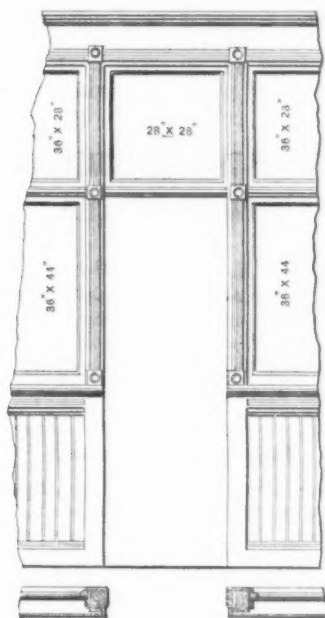


Fig. 367.—Section of Office Partition.—Scale,  $\frac{1}{4}$  Inch to the Foot.

the salesroom, there are two panels similar to those in front window, each 18 x 42 inches, which are sampled attractively, so as to arrest the attention of those passing up and down the stairs.

The stair-way commences just in the rear of the office, as shown in the plan, and is open, broad and easy of ascent, with a heavy baluster and rail extending around the opening of the second story. The finish of this stair-way is shown in Fig. 364. The plan of the second floor is shown in Fig. 351. This floor is devoted to the wholesale stock and to Stoves. It is the same size as the salesroom, only the private office in front is larger than the office below. The ceiling is 12 feet in height. There are six stationary Stove platforms, each 14 feet long, 30 inches wide and 7 inches high. They are so arranged as to allow room for Stove trucks to run on either side. There is also a Stove platform on the left-hand side 54 feet long, 41 inches wide and 7 inches high. These platforms afford room for the display of 50 Parlor Stoves and 24 Cook Stoves. Extending along the wall above the left platform is 21 feet of shelving suspended from the ceiling by eight rods of  $\frac{1}{4}$ -inch rod-iron. This shelving is 31 inches wide. The upper two shelves are 2 feet from the ceiling and the lower two 5 feet 4 inches from the ceiling. This shelving is used for surplus Tin-Ware. The upper shelf may also be used for storing Scythes in boxes. Next beyond the chimney and extending 16 feet there are divisions made specially for long-handled tools, such as Shovels, Spades, Forks, Rakes and Handles. There are five divisions 2 feet deep by 2 feet wide and 6 feet high, and three divisions 7 feet high. Goods in original packages are kept here, handy to elevator. The part above this is divided

into places 2 and 3 feet high for Stove-Pipe Elbows, Sheet-Iron Goods or smaller articles of Hardware or Wooden-Ware.

Commencing now opposite the landing of stair-way, as indicated in the plan, there is an unbroken stretch of shelving 50 feet long and 16 inches deep. The counter-shelf is 24 inches wide and 4 feet above the floor. This shelving extends to ceiling and is divided into 58 compartments 24 inches high and 30 inches wide, leaving an upper shelf at top 20 inches high, which is used for Stamped-Ware. Below are kept surplus Shelf and Heavy Hardware. The sections of shelving being short, the heavy weight of goods does not cause the shelves to sag. The first four sections in front on counter-shelf are inclosed with two doors each and have two shelves, making four closets 24 inches high and 30 inches wide. Light and dust are thus excluded from these closets which are used for Wood Planes. Under these closets and counter-shelf we have four divisions for Axe-Helves and Handles. They are 7 inches wide, 24 inches deep and 44 inches high. Next are four sections 44 inches long by 30 inches wide and 24 inches deep, each having three shelves, top shelf being 10 inches high, next 14 inches and the bottom 18 inches. Each section holds 40 articles of Furniture for Cooking Stoves. This arrangement has been found very convenient from the fact that in selling a Stove, especially when busy, much time is saved by resorting to this place, which can be easily filled when business is not pressing. These four sections are needed in order to supply two grades of Stove Furniture. Thus there is one set each of 8 and 9 and both grades in readiness. The remainder of the room under the counter-shelf is divided into spaces 44 by 30 inches for Shovels and other goods. All the shelving and platforms are made from  $\frac{1}{4}$ -inch pine lumber, except the top of the Stove platforms, which is maple. The brick walls are painted in Milwaukee brick color and penciled in Indian red.

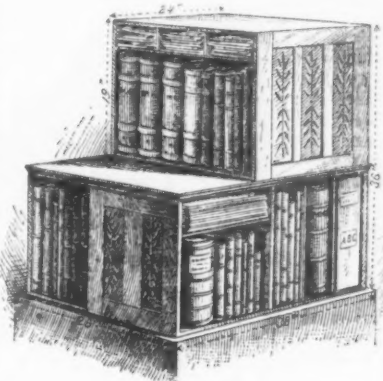


Fig. 368.—Book-Case on Top of Safe.

The ceiling is painted white, the platforms for Stoves being given a drab color.

The basement, the plan of which is shown in Fig. 349, is reached by a wide stair-way under the upper-story stairs and is of the same size as the salesroom excepting the extra width of the foundation walls. The floor is of 2-inch surfaced and sized pine laid over a bed of concrete 5 inches deep, with 4 x 4 inch stuff bedded in for the plank. The basement is 8 feet high, and is, we are advised, found dry at all seasons, and articles deposited in it are kept from rust. It thus becomes a convenient place for the storage of Stoves of customers. At the stair landing is the Skein rack, which is divided into 14 spaces. Adjoining this is the brick ash-pit, which extends the full height of the basement and receives the ashes of the salesroom and second-floor fire-places. Next is the table for cleaning

lamps. Under the sidewalk is a room 10 x 22 feet, reached through the arches shown in the plan. In winter this room is used for the coal and wood requisite to heat the establishment and in summer for the storage of oil. The stock

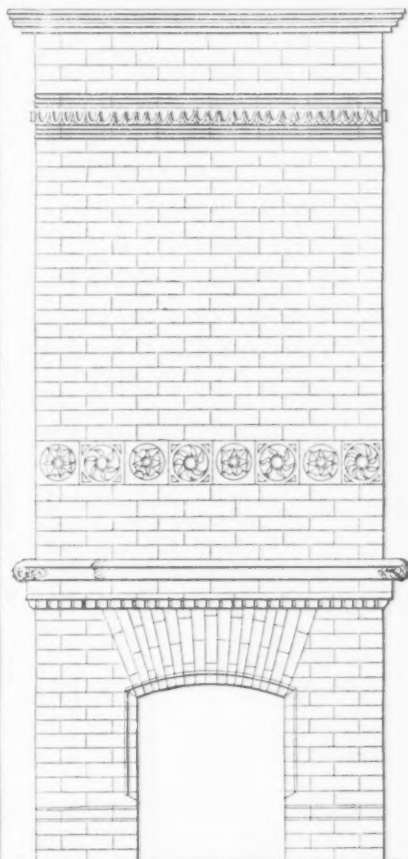


Fig. 369.—Office Chimney-Piece.—Scale,  $\frac{1}{4}$  Inch to the Foot.

of Rope, Twine, Pumps and Hollow-Ware is kept in the basement. Nails are kept in stalls, which save room, and near the elevator at the left is the stock of Band and Hoop Iron. Stoves are placed in the center. The elevator drops into a cell on reaching the basement, thus making its platform level with the floor. Commencing at the rear window on the right-hand side is a platform 20 inches high, where Glass is kept for retail in the original boxes, standing on end, each width by itself, ranging from 7 to 36 inches. Each box has a tag incased with tin indicating the size. This arrangement is preferred to a rack, as in case of a new size being added the boxes may be moved along to make room. The boxes are not changed except when broken. Next on the same platform comes the stock of Oils and Varnishes. Adjoining this is a closet for the storage of old papers and books not used. Under the stair-way and next to this closet is a sink supplied with city water, the waste being connected with a 6-inch sewer-pipe laid in concrete under the floor.

Figs. 365 and 366 indicate the floor plans of the annex, which is in the rear of

the establishment already described. It is reached by a platform 20 feet broad running from the main salesroom. The annex is two stories in height, with 12-inch brick walls and hard-wood floors, and has a large door at each end 5 feet in width. In the lower story goods are received,

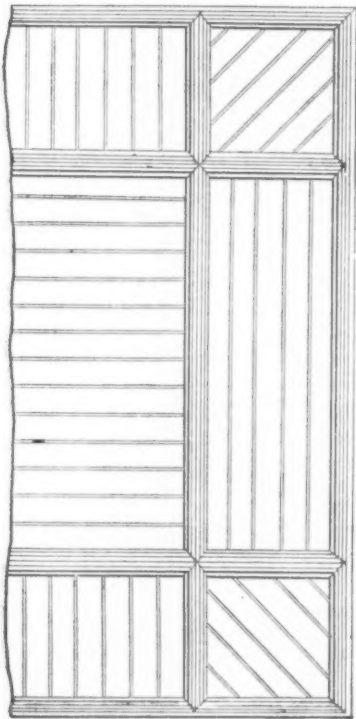


Fig. 370.—Part of Office Ceiling.

while they are sent out by the alley in rear. Here also is the water-closet and a platform for Sash, a rack for Panel-Doors and an Iron rack. Under the stair-way is a closet for keeping uncalled-for Tin-Ware left for repair. In the second story is the tin-shop, 22 x 32 feet and 12 feet high, and lighted by 13 windows, the sills

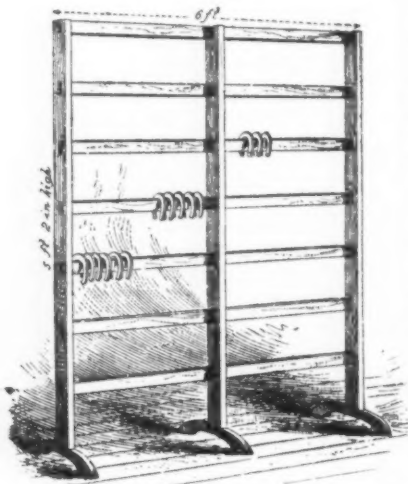


Fig. 371.—Horseshoe Rack.

being 3½ feet from the floor, thus affording room for the benches beneath the windows. There are two main benches, as per plan, one center bench for sheet-iron work and a short bench for work at vise. The stock of Gas-Pipe is kept convenient to the machine, and is received at the rear door in the alley and sent out from the large door over the platform leading to the store. Pipe-Fittings are kept near the stair-way. At the end of the stair-railing is a sink supplied with water

from the city works, the waste running off to the sewer-pipe under the store. The entire arrangement of the shop is convenient for keeping the gas-pipe work by itself. Crossing the alley, another brick building is reached fronting on another street. This building is 25 feet front and 75 feet in depth, and is used as a storehouse for Wagon Wood-Work, Seed and Agricultural Implements.

#### THE W. BINGHAM COMPANY,

Cleveland, Ohio, have opened an exceptionally complete and attractive retail department in the Perry-Payne Building, 97 and 99 Superior street, Cleveland, Ohio, their wholesale business continuing at the old stand, 146, 148 and 150 Water street. This gives them the necessary increase in facilities for both their retail and jobbing departments. The following description of the establishment will be of interest:

Each floor of the new store is directly connected with the wholesale building fronting on Water street by a covered bridge, the two basements being joined by a tunnel under the alley-way. The new retail store is in mahogany, the fixtures are of polished quartered oak, and the handsome show-cases, of special design, are admirably adapted to the beautiful goods displayed. The shelves from the floor to the ceiling on both sides of the room hold rows of boxes tastefully covered with green billiard-cloth, on which are displayed over 10,000 samples of the goods they contain. Some idea of the extent and completeness of the stock may be gained from the fact that in the item of Files alone they show over 1200 different styles and sizes and more than 1000 styles and sizes of Drills.

The general arrangement of the store is perfect, utility being the first point considered. The basement, easily reached by stair-way or elevator, is given up to Gas and Steam Fitters' Supplies, Brass goods, Belting, Packing and general Factory Supplies. Very complete lines of Refrigerators, Ice-Cream Freezers and Wooden-Ware are displayed on the third floor.

The manager's desk is near the center of the main floor and the retail offices are at the rear. The buyer and his assistants have a cosy office overlooking the retail floors and as easily reached from the wholesale departments. The wholesale business remains as before, at Nos. 146, 148 and 150 Water street, the entire establishment now occupying, with the warehouses on Frankfort street, over 90,000 square feet of floor space. The new stores are supplied with every possible convenience, even to a rapid cash system, and are brightly lighted by incandescent lamps from a private plant.

#### Selling Goods.

"The Art of Selling" is the title of a little work by F. B. Goddard, which possesses a great deal of interest for those engaged in the wholesale and retail trades. What the author has to say is confined within a volume of 128 pages, attractively bound in red muslin covers, and is issued by the Franklin Publishing Company. In this work the author seeks to set forth in a manner to be really understood by all what are believed to be some of the more important guiding principles applicable to the art of selling goods. Facts and suggestions gathered from merchants and salesmen in many lines of trade are clearly stated, to the end that he who stores his mind with what he reads may derive profit and value therefrom. A feature of the book and one less emphasized in other works touching the general subject referred to above is a chapter presenting rules and directions for reading character, a qualification eminently desirable in many lines of trade. Chapters are given on changes in business conditions and methods, salesmen's compensation, opportunities and prospects, commercial travelers, saleswomen and the most important legal principles, points and

decisions governing sales. The chapter possessing more than the average interest to the retail trade is that entitled "Retail Merchants and Salesmen," in which the author presents suggestions which may be followed with profit by all. He tells how not to succeed and cites points from prominent New York merchants relative to the characteristics of salesmen.

The information and data contained within the covers of the book have been compiled at the expense of no little time and labor, and great care has been exercised to procure only that which was reliable and of special interest to commercial men of all classes. The legal principles, points and decisions governing sales have also been compiled from standard legal authorities. We commend the little work, which costs but 50 cents, to the careful consideration of all engaged in business pursuits.

#### REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

#### Paints and Colors.

There have been no new developments in any quarter calculated to disturb the quietude that usually prevails at this season of the year. The requirements for consumption seem to be merely of ordinary value; nothing transpires in the situation of crude materials that would prompt buyers to stock up heavily, nor are new special inducements in the way of tempting low prices made by sellers of any class of goods. In fact, the situation in nearly every particular is precisely the same at the present time as it was a week ago.

The somewhat sensational article published in a local journal purporting to show that the actual value of the properties controlled by the National Lead Trust is only \$15,000,000, against \$83,000,000 of certificate capitalization, has attracted a certain degree of interest. Inquiry at the proper source reveals the fact that the alleged list of companies in the trust covers only 11 out of 28, the correct number; and, furthermore, that the stockholders of the various companies have not been so unbusiness-like as to agree to a capitalization on which there is no chance of a dividend being paid.

**White Lead.**—Several firms report a rather better trade than was experienced during the preceding week. Some fair-sized orders were declined from jobbers, who permitted their stocks to run very low because of the uncertainty as to whether the trust would make any revision of prices or rebates. Retailers who did the same thing, for similar reasons, have also found it necessary to take hold with more liberty. No change has been made in prices, rebates or delivery points by the trust, and "independent" companies are making no special terms.

**Zincs.**—The sales of American Zinc in jobbing quantities have been very fair, and the demand is equal to what is customary at this season. Supplies in first hands remain in very good shape, and prices for the several grades are steady. Foreign Zinc is firm at previous prices, and a good portion of the supply coming forward is taken up in filling small orders that come along steadily.

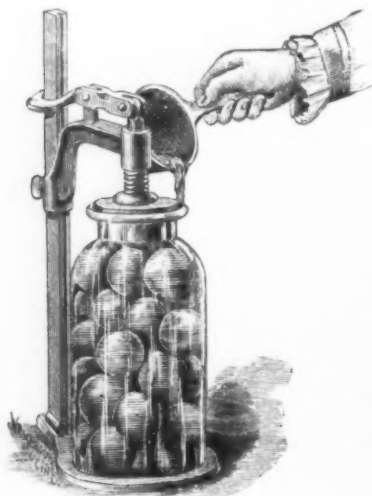
**Colors.**—Several of the manufacturers of Quicksilver Vermilion have withdrawn quotations for the present, owing to the enhanced cost of Quicksilver and con-





**Star Fruit-Can and Glass-Jar Holder.**

L. H. Schmidt, of 405 Central avenue, Cincinnati, Ohio, is introducing to the trade a seasonable specialty called the Star Fruit-Can and Glass-Jar Holder, designed for use in sealing cans and jars. The device, as illustrated herewith, is made entirely of iron, and consists of an ornamental platform to which is secured an



*Star Fruit-Can Holder.*

upright standard. Attached thereto is an adjustable arm to suit all sizes of cans or jars. To the arm is secured a spring lever under which is placed the article to be sealed. The device measures about 12 inches in height and is claimed to obviate all danger of burning the hands of the operator or spoiling the fruit. The holders are neatly japanned and packed in cases containing one half-dozen each.

**Evan's Patent Anti-Rusting Tin-Ware.**

In the accompanying illustrations we show a number of articles of tin-ware which are offered the trade by the Clifton Springs Mfg. Company, of Clifton Springs, N. Y., under the general name of Evan's Patent Anti-Rusting Ware. These goods are well made of IX best quality Melyn tin and are warranted not to rust. The water-pails turned out, a view of one of which is shown in Fig. 1 of the cuts, are made with bottoms raised  $\frac{3}{4}$ -inch, leaving a strong rim to protect the bottom, and also to serve the purpose of a handle when emptying the pail of its contents. There



*Evan's Patent Anti-Rusting Tin-Ware.—  
Fig. 1.—Water-Pail.*

are no hoops to shrink and the pail will not become soaked if water is allowed to stand in it. Fig. 2 shows a sprinkling-pot



*Fig. 2.—Sprinkling-Pot.*

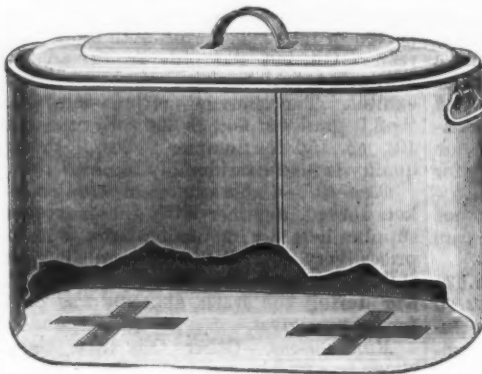
have recently added to their assortment. The demand for anti-rusting goods is reported so great that the company contem-

which is made in two sizes and has a capacity of 10 and 12 quarts. Fig. 3 shows a 2-quart dipper; Fig. 4, a dish-pan made in either 5,  $5\frac{1}{2}$  or 6 pieces, as may be pre-



*Fig. 3.—Dipper*

ferred, and Fig. 5, a new pattern of wash-boiler made in three sizes. In Fig. 6 is presented a neat style of commode, while



*Fig. 5.—Wash-Boiler.*

in Fig. 7 is shown a form of toilet-carrier, painted and decorated, which the company



*Fig. 7.—Decorated Toilet Carrier.*

**The Keystone Ice-Cream Freezer.**

This article, which is represented in the accompanying illustration, is manufact-



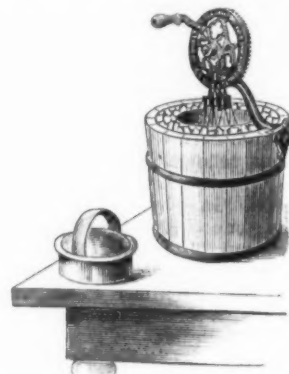
*Fig. 4.—Dish-Pan.*

ured by Paine, Diehl & Co., Philadelphia, Pa. It will be perceived that it is an adaptation of their Keystone Beater to use



*Fig. 6.—Commode.*

in a freezer, and is, in fact, an attachment to the old No. 1 Keystone Beater. Instead of attaching the beater to the wall, as in ordinary use, it is fastened to a tub and made to operate in a freezing-can of tin, instead of the usual glass jar. The ease with which it works and the efficiency of its operation are points made in regard to it, while emphasis is laid on the inexpensiveness of the outfit, \$1.50 being the price for a No. 1 Keystone Whip and Mixer, a 1-quart glass jar, a white cedar tub and a



*The Keystone Ice-Cream Freezer.*

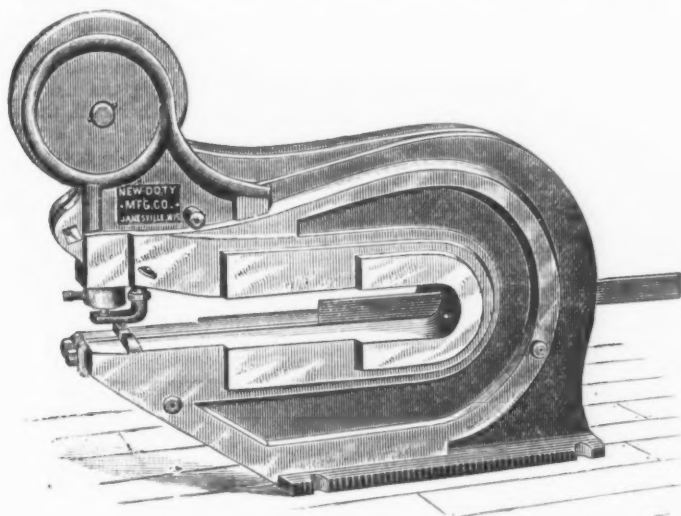
heavy tin freezing-can. It is to be observed that the whip and mixer can readily be transferred to or from the freezer, thus making a very convenient utensil. A book of recipes is also furnished with it. To those already having the beater the freezer attachment is sold for 75 cents.

President Wilson, of the New York Board of Health, who has been making a personal inspection of several manufacturing establishments, with a view to the enforcement of sanitary improvements in them, says that he intends to continue the work and to see that the laws for the protection of the public health are applied in those establishments by which they are disregarded.



**Hand-Power Punch.**

This punch, represented in the accompanying illustration, is made by the New Doty Mfg. Company, Janesville, Wis.,

*Hand-Power Punch.*

and is specially adapted for the lighter punching when a greater depth of jaw is needed than is usual with machines of its capacity. It will punch a  $\frac{1}{4}$ -inch hole in  $\frac{1}{4}$ -inch iron to the center of 30 inches. It is operated by an eccentric, which, in turn, is worked by a hand-lever. The plungers and all bolts are of steel. All necessary gauges are provided, and the punch is fitted with an improved stripper, which is adjustable to the slightest variations. Three sizes of punches and dies are furnished with each machine— $\frac{1}{8}$ ,  $\frac{3}{16}$  and  $\frac{1}{4}$  inch diameter.

**The Paragon Skewer-Puller.**

The accompanying illustration represents a simple invention which is put on the market by the Buffalo Seal and Press Company, 430 to 438 Niagara street, Buffalo, N. Y. As will be inferred from the name and illustration, the object of this article is to extract the skewer from a joint of meat on the table. It is about the size of a teaspoon, made of steel and handsomely plated. By means of it the skewer can readily be laid hold of and drawn without difficulty, thus saving the carver from annoyance often experienced. They are adapted for skewers of different sizes and are packed one dozen in a box. They are intended to retail at 25 cents each.

There are enormous deposits of soda in Wyoming Territory, estimated to measure 52,000,000 tons, covering many acres, in

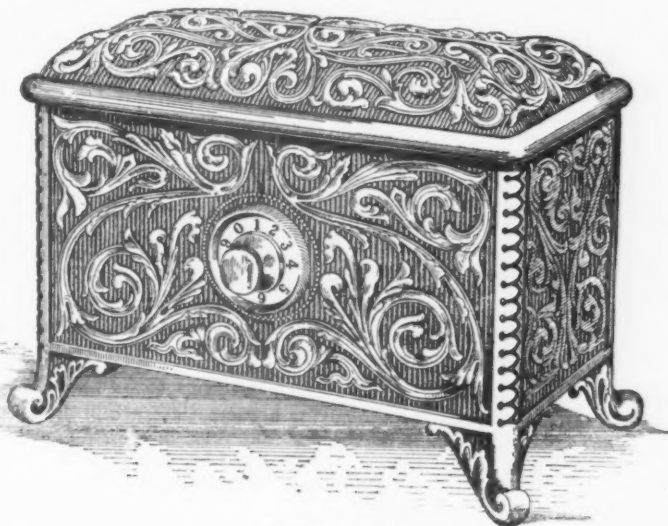
geologist says: "The deposits of the sulphate and of the mixture of the sulphate and carbonate of sodium in Wyoming are of great interest and importance on account of the immense amounts in which

point constantly employs 300 switching-engines; that the number of cars interchanged between railways there is 2,500,000, of which fully 2,000,000 are interchanged between roads whose yards are not adjoining each other. The plan of separating this interchange switching business from that done by each company in their own yards and putting it in the hands of a separate company representing all the roads is proposed.

**Treasure-Box.**

The Henry C. Hart Mfg. Company, Detroit, Mich., in connection with their line of savings-banks, are manufacturing what they call Our Treasure-Box, which is represented in the illustration given below, from which it will be seen that it is an artistically-made savings-bank, suitable also for use as a jewel-case or similar purposes. It is made in different styles of finish, such as highly-polished brass with antique relief, silver plate and antique brass. It is secured by means of a combination lock. Its dimensions are: Length,  $6\frac{1}{2}$  inches; width,  $3\frac{1}{2}$  inches; and height,  $4\frac{1}{2}$  inches.

The water-works tunnel under the lake at Cleveland, Ohio, presents serious engineering difficulties, arising from the quicksands which the tunnel must penetrate. The city has just concluded a contract with the engineers, SooySmith &

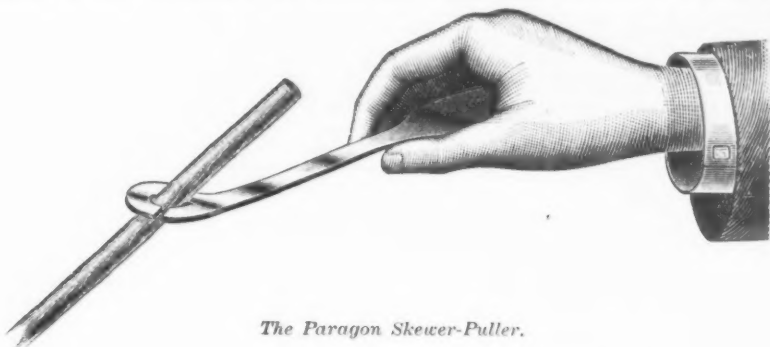
*Treasure-Box.*

soda at home and making products that will permit transportation to a large market—are available."

The immensity of the freight-car interchange business in and about Chicago by the many lines centering at that city is

Co., who expect to overcome the impediment by means of air-compressors and metal shields. The firm will act as consulting engineers for Casement & Co., who are responsible for the work, paying the sub-contractors \$2000 a month. The machinery to subdue the quicksand comprises air-locks and shields to protect the headings, of the same general character as the apparatus employed in the Hudson River tunnel, where the engineers formerly had much experience.

The plans of the British Government to concentrate maritime commerce at the terminus of the Canadian Pacific Railway have excited apprehension in San Francisco, as well as the scheme for putting on a fast mail line from Vancouver to Yokohama and Hong-Yong and the proposed cable from Victoria to Honolulu and Australia. Leading merchants and shipping men see the importance of continuing American mail lines to Australia and China, of an ocean cable to Australia and of coast defense and a new navy. The plan is to have the California delegation in Congress meet the principal merchants and learn all the facts in the case, in order to make a strong presentation of the needs of the coast at the next session.

*The Paragon Skewer-Puller.*

one instance to a depth of 40 feet. While these are comparatively neglected on account of their distance from market, the United States imports annually nearly or quite 50,000 tons from England, at a cost of about \$3,000,000. The Territorial

probably not appreciated except by the few who have directly to do with this traffic. It is estimated that in a single year the number of cars moved to and from Chicago aggregates no less than 6,000,000; that the moving of these cars at that

### Statistics of Pig-Iron Production.

James M. Swank, general manager of the American Iron and Steel Association, has just published the statistics of the production of all kinds of pig-iron in the United States in the first six months of the present year and of the stocks of unsold pig-iron in the hands of manufacturers or their agents on June 30. The production of pig-iron in the first six months of 1889 was larger than in any preceding six months in the history of the American iron trade. The total production of pig-iron in the United States in the first six months of 1889 amounted to 4,107,899 net tons of 2000 pounds, or 3,667,767 gross tons of 2240 pounds. The production in the last six months of 1888 was 3,886,004 net tons, or 3,469,646 gross tons. The production in the first half of 1889 was 198,121 gross tons more than in the second half of 1888. The increased production of pig-iron in the first half of 1889 was wholly in those kinds which are used for general foundry and mill purposes; there was a decrease in the production of Bessemer pig-iron.

Nearly all the leading pig-iron-producing States increased their production in the first half of 1889 as compared with the last half of 1888. The following States show an increase: Connecticut, New York, New Jersey, Pennsylvania, Virginia, Alabama, West Virginia, Tennessee, Ohio, Wisconsin, Missouri, Oregon and Washington Territory. The following States show a decrease: Maine, Massachusetts, Maryland, North Carolina, Georgia, Texas, Kentucky, Indiana, Illinois, Michigan and Colorado. The production of pig-iron in the Southern States in the first half of 1889 was much larger than in the last half of 1888, but for this gain Alabama is entitled to the most credit.

Among the Northern States which have made progress in the first half of 1889 New York, New Jersey and Ohio are most conspicuous, each State making a decided gain. It is also noteworthy that Pennsylvania gained largely upon her large production in the second half of 1888. The decrease in the production of Illinois was only nominal. The stocks of pig-iron which were unsold in the hands of manufacturers or their agents on June 30, and which were not intended for the consumption of the manufacturers, amounted to 502,934 gross tons, against 900,144 gross tons on the 31st of December last, an increase of 202,790 gross tons in six months. It should be borne in mind, however, that these stocks have been very heavily reduced since June 30, by reason of the activity now prevailing in the pig-iron trade. The exact number of furnaces which were in blast on June 30 was 288, of which 145 were bituminous coal and coke, 80 anthracite and 63 charcoal.

The Ehman & Simon Mfg. Company, Chicago, some weeks ago received an order for samples of their finest oak and walnut mantels from a large jobbing house in Dublin, which they shipped last week. Their trade has been rapidly increasing in the past six months. Recent shipments were made to Boston, New York City, Washington, Kansas City, Omaha and San Francisco. Since January this year they have brought out 60 new patterns in mantels and overmantels. Twenty-one of these have just been photographed and embrace a number of very unique designs, among which a bedroom mantel is the most novel. The mantel is in general form of the standard pattern, with a large dressing-mirror extending from the floor to the top on the side of the fire-place. The base of the mirror-frame is made with and without toilet-drawers. They are also introducing a number of new things in the way of specially-designed library and hall mantels

for fine residences. They manufacture these goods from walnut, cherry, mahogany, oak, birch and sycamore, or any of the native woods. They also make a line of mantels in imitation of some of these woods, but the tendency of trade is toward the solid stuff. They have been adding some improved machinery to their manufacturing department and are looking toward extending their facilities in other directions.

### NEW PUBLICATIONS.

**THE OFFICIAL RAILWAY LIST FOR 1889.** A complete directory of the presidents, vice-presidents and other officials of railways in North America, and hand-book of useful information for railway men. Published by the Railway Purchasing Agent Company, 816 "The Rookery," Chicago.

This is a book of 285 pages, which will be found exceedingly useful by parties wishing to secure the names and addresses of the managers of different departments of the railroad companies of the country. In addition to the personal information thus given in connection with the railroad interest, the book also contains the logging railroads of the country, the sleeping-car companies, and lists of the various railroad associations, together with the national and State railroad commissioners. Road-masters will also find in it much useful information. It further contains master car-builders' and master-mechanics' standards.

It is now more apparent than ever that the export of adulterated articles such as "butterine" and cotton-seed lard operates prejudicially to trade. At the present time the accumulation of butter in this city is enormous, comprising many million pounds, and at the low prices now prevailing ought readily to find a market abroad. But European dealers have learned to look to other sources of supply.

The Naval Board again went down Chesapeake Bay, the 18th inst., to test the new gunboat Petrel. On their return it was learned that her best speed, under forced draft, was 13.7 knots, or 15 1/4 statute miles, for a short time, while the average speed for the four hours' test was only 11 1/2 knots, or 13 1/2 statute miles. It is thought that the low average speed is due to improper coaling, the coal being of poor quality and the fires being started long before the test.

The Baltimore and Ohio, Lake Erie and Pennsylvania roads have reduced the coke rates to the lakes at the request of the coke manufacturers. The demand was made some time ago, and finally acceded to by the railroads. The reductions are as follows: Detroit, from \$2.65 to \$2.35; Toledo, from \$2.50 to \$2.35; Cleveland, \$1.80 to \$1.70. These are the main places, and the reductions apply to a number of intermediate points, as Sandusky, Findlay, Tiffin, Monroeville, Fostoria and Elyria.

The war in Hayti, so called, has dwindled in proportions until now it is simply a siege of Port-au-Prince, and this is likely to suddenly end. It is hoped that the foreign war vessels will be able to save the city from pillage and destruction.

Consul Bird, at Laguayra, reports to the State Department that the Spanish steamship Conde de Vilana left Barcelona on June 13, having on board an exhibition consisting of raw products and manufactures from all parts of Spain. The vessel will make a tour of the ports of South America, and perhaps of those of Mexico and Central America, with the object of

displaying these articles and of opening the markets of the countries visited to Spanish goods.

Alexander Y. Lee, of Pittsburgh, has prepared a lithograph giving a bird's-eye view of the Connellsville coke region, showing the lines of railroads traversing the section, and giving the names of the coke operators, together with the number of ovens owned by each. It is an excellent representation of this great source of the supply of blast-furnace fuel.

Damage awards to property-owners in suits against the elevated roads in this city have been made for more than \$800,000, and only \$76,000 has been paid. Suits are now pending for more than \$5,000,000.

### CONTENTS.

Blowing-Engine. Illustrated.....	118
The Basic Steel Process.....	119
Coke-Workers Ask an Advance.....	120
American Engineers in Germany.....	120
New Iron Works in Algeria.....	121
Cold Saw Cutting-Off Machines. Illustrated.....	122
Coal and Iron in British Columbia.....	122
Vertical High-Speed Engine. Illustrated.....	123
The Mullins Silica Process.....	124
A Treasury Decision on Drawbacks.....	124
The Archer Gas-Producer.....	124
Robie Screw-Jack. Illustrated.....	125
Iron-Ore Production of New York.....	125
The Advance in German Wages.....	125
Elevator Gearing. Illustrated.....	126
Securing Cheaper Fuel at Pittsburgh.....	126
Important Tariff Decisions.....	126
Hand Reaming-Machine. Illustrated.....	126
The Week.....	127
Manufacturing:	
Iron and Steel.....	128
Machinery.....	128
Hardware.....	129
Miscellaneous.....	129
Editorials:	
The Proposed Exposition in 1892.....	130
A Few Points on the Export Trade.....	130
The Salt Combination.....	131
Late Developments in Peru.....	131
Obituary.....	132
The Craig Russia Sheet-Iron.....	132
The Scripps League.....	133
Personal.....	133
Trade Report:	
Chicago.....	134
Philadelphia.....	134
Cleveland.....	135
Cincinnati.....	135
Louisville.....	136
St. Louis.....	136
Chattanooga.....	136
Pittsburgh.....	136
Detroit.....	137
New York.....	137
Financial.....	138
Metal Market.....	138
New York Metal Exchange.....	139
Imports.....	139
Coal Market.....	139
British Iron and Metal Markets.....	139
Foreign Markets.....	140
Hardware:	
Cut Nails.....	140
Miscellaneous Prices.....	140
Items.....	140
Wrought-Iron Pipe.....	141
Trade Topics.....	141
Exports.....	142
Arrangement of Stores.....	143
Selling Goods.....	148
Review of the Wholesale Market in Paints and Oils:	
Paints and Colors.....	148
Animal and Vegetable Oils.....	149
Trade Items.....	149
Wholesale Prices.....	149
Star Fruit-Can and Glass-Jar Holder. Illustrated.....	150
Evan's Patent Anti-Rusting Tin-Ware. Illustrated.....	150
The Keystone Ice-Cream Freezer. Illustrated.....	150
Hand-Power Punch. Illustrated.....	151
The Paragon Skewer Puller. Illustrated.....	151
Treasure-Box. Illustrated.....	151
Statistics of Pig-Iron Production.....	152
New Publications:	
The Official Railway List for 1889.....	152
Current Hardware Prices.....	153
Current Metal Prices.....	158
Classified List of Advertisers.....	85
Alphabetical Index to Advertisers.....	88



# CURRENT HARDWARE PRICES.

JULY 24, 1889.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers' name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

## Ammunition.—

Caps, Percussion, 1000—

Hicks & Goldmark's	
F. L. Waterproof, 1-10's.....	50¢
E. B. Trimmed Edge, 1-10's.....	65¢
E. B. Grnd. Edge, Cent. Fire.....	25¢
1-10's, 70¢.....	75¢
Double Waterproof, 1-10's.....	\$1.40
Musket Waterproof, 1-10's.....	50¢
G. D. ....	28¢
S. B. ....	30¢

Union Metallic Cartridge Co.

F. C. Trimmed.....	50¢
F. L. Ground.....	25¢
Cent. Fire Ground.....	70¢
Dbl. Waterproof, 1-10's.....	\$1.40
Dbl. Waterproof, 1-10's.....	\$1.40
S. B. Genuine Imp.orted.....	45¢
Wiley's E. B. ....	54¢
Wiley's D Waterproof, Central Fire.....	\$1.60

Cartridges.

Rim Fire Cartridges.....	50¢ & 52¢
Rim Fire Military.....	15¢ & 2¢
Cent. Fire, Pistol and Rifle.....	25¢ & 52¢
Cent. Fire, Military and Sporting.....	15¢ & 52¢

Blank Cartridges, except 22 and 32 cal., additional 10¢ on above discounts.	
Blank Cartridges, 22 cal., \$1.75.....	2¢
Blank Cartridges, 32 cal., \$3.50.....	2¢
Primed Shells and Bullets.....	15¢ & 52¢
B. H. Caps, Round Ball, \$1.75.....	2¢
B. H. Caps, Con. Ball, Swgd., \$2.00.....	2¢

Primers—

Berdan Primers, \$1.00.....	2¢
B. L. Caps (for Sturtevant Shells) \$1.00.....	2¢
All other Primers, \$1.20.....	2¢

Shells—

First quality, 4, 8, 10 and 12 gauge.....	25¢ & 10¢
First quality, 14, 16 and 20 gauge (\$10 list).....	30¢ & 10¢
Star, Club, Rival and Climax.....	20¢ & 10¢

Seibold's Comb. Shot Shells.....	15¢ & 2¢
Brass Shot Shells, 1st quality.....	60¢ & 2¢
Brass Shot Shells, Club, Rival, Climax.....	65¢ & 2¢

I X L, 10 and 12 gauge.....	40¢ & 10¢
"Special," 16 gauge.....	30¢ & 10¢
"Special," 10 and 12 gauge.....	40¢ & 10¢
Fowler's Pat.....	\$3.25

Shells Loaded—

A. M. Co. List No. 19, 1887.....	40¢ & 10¢
----------------------------------	-----------

Wads—

U. M. C. & W. R. A.—B. E., 11 up.....	\$2.00
U. M. C. & W. R. A.—B. E., 9 & 10.....	2.30
U. M. C. & W. R. A.—B. E., 7 & 8.....	2.60
U. M. C. & W. R. A.—P. E., 11 up.....	3.10
U. M. C. & W. R. A.—P. E., 9 & 10.....	4.00
U. M. C. & W. R. A.—P. E., 7 & 8.....	4.00

Wiley's B. E., 11 up.....	\$1.75
Wiley's P. E., 11 up.....	2.80

Anvils—

Eagle Anvils, 10 lb.....	20¢ & 20¢
Peter Wright.....	95¢
Armstrong's Mouse Hole, Extra, 11 lb.....	85¢
Armstrong's Mouse Hole, Extra, 11 lb.....	11¢
Trenton.....	95¢
Wilkinson's.....	95¢
J. & Riley Carr, Pat. Solid.....	11¢
Moore & Barnes Mfg. Co.....	33¢

Anvil Vise and Drill—

Witlers Falls Co., \$15.00.....	20¢
Cheney Anvil and Vise.....	25¢
Allen Anvil and Vise.....	\$3.00
Allen Anvil and Vise.....	40¢ & 10¢

Apple Parers—

Advance.....	50¢
Antrim Combination.....	50¢
Baldwin.....	50¢
Champion.....	75¢
Daisy.....	75¢
Eureka, 1888.....	17.00
Family Bay State.....	12.00
Favorite.....	5.00
Gem.....	5.25
Gold Medal.....	4.00
Ideal.....	4.00
Improved Bay State.....	30.00
Little Star.....	4.50
Monarch.....	13.50
New Lightning.....	5.50
Oriole.....	4.00
Penn.....	4.00
Perfection.....	4.00
Pomona.....	4.00
Rocking Table.....	6.00
Turntable.....	4.50
Victor.....	13.50
Waverly.....	4.00
White Mountain.....	4.50
72.....	4.25
78.....	5.75

Augers and Bits—

Douglas Mfg. Co.....	70¢
Wm. A. Ives & Co.....	
Humphreysville Mfg. Co.....	
French, Swift & Co. (F. H. Beecher).....	
Rockford Bit Company.....	
Cook's, Douglas Mfg. Co.....	55¢
Cook's, N. H. Copper Co. 50¢ & 10¢ & 50¢	
Ives' Circular Lip.....	60¢
Patent Solid Head.....	30¢
C. E. Jennings & Co., No. 10, extension.....	40¢
Up.....	40¢
C. E. Jennings & Co., No. 30.....	60¢
C. E. Jennings & Co., Auger Bits, 1/2 set.....	32¢
3/4 quarters, No. 5, 10; No. 30, \$3.50, 30¢	
Lewis' Patent Single Twist.....	45¢
Jennings' Augers and Bits.....	25¢
Imitation Jennings' Bits.....	60¢ & 10¢
Pugh's Black.....	20¢
Rockford, Jennings' Pattern.....	60¢
Car Bits.....	60¢ & 10¢
L. Hommedieu Car Bits.....	15¢ & 10¢
Forstner Pat. Auger Bits.....	10¢

## Hollow Augers—

Ives'.....	33¢ & 10¢
French, Swift & Co.....	33¢ & 10¢
Douglas'.....	40¢ & 10¢
Stearns'.....	20¢ & 10¢
Ives' Expansive, each \$4.50.....	50¢ & 5¢
Universal Expansive, each \$4.50.....	20¢
Wood's.....	25¢ & 25¢ & 10¢

## Expansive Bits—

Clark's small, \$18; large, \$26.....	35¢ & 35¢ & 5¢
Ives' No. 4, 1/2 doz \$60.....	40¢
Swan's.....	40¢
Stearns' No. 2, \$18.....	20¢

## Gimlet Bits—

Common.....	27¢ & 25¢ & 25¢
Diamond.....	\$1.10.....
See.....	25¢ & 25¢ & 5¢
Double Cut, Shephardson's.....	45¢ & 45¢ & 10¢
Double Cut, C. Valley Mfg. Co.....	30¢ & 10¢
Double Cut, Hartwell's, 1/2 gro.....	\$5.25
Double Cut, Douglas'.....	40¢ & 10¢
Double Cut, Ives'.....	60¢ & 60¢ & 10¢

## Bit Stock Drills—

Morse Twist Drills.....	50¢ & 10¢ & 5¢
Standard.....	50¢ & 10¢ & 5¢
Cleveland.....	50¢ & 10¢ & 5¢
Syracuse, for metal.....	50¢ & 10¢ & 5¢
Syracuse, for wood (wood list).....	30¢ & 30¢ & 5¢
Williams' or Holt's, for metal.....	50¢ & 10¢ & 5¢
Williams' or Holt's, for wood.....	40¢ & 10¢

## Ship Augers and Bits—

L'Hommedieu's.....	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Watrous'.....	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Snell's.....	15¢ & 10¢ & 15¢ & 10¢ & 5¢
Snell's Ship Auger Pat'n Car Bits.....	15¢ & 10¢ & 15¢ & 10¢ & 5¢

## Awl Hfts—

Sewing, Brass Fer. 1/2 gr.....	\$3.50.....
Pat. Sewing, Short.....	\$1.00.....
Pat. Sewing, Long.....	\$1.20.....
Pat. Peg, Plain Top.....	\$1.00.....
Pat. Peg, Leather Top.....	\$1.20.....

## Awls, Brad Sets, &c—

Awls, Sewing, Common.....	\$1.70.....
Awls, Should. Peg.....	\$2.45.....
Awls, Pat. Peg.....	40¢ & 10¢
Awls, Shouldered Brad.....	2.70.....
Awls, Handled Brad.....	\$7.50.....
Awls, Handled Scratch.....	\$7.50.....
Awls, Socket Scratch.....	\$1.50.....

## Awl and Tool Sets—

Alken's Sets, Awls and Tools.....	
No. 20, 1/2 doz \$10.00.....	55¢ & 10¢
Fray's Adj. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$20.....	25¢ & 25¢ & 10¢
Miller's Falls Adj. Tool Hds.....	25¢
Henry's Combination Hft.....	25¢
Brad Sets.....	
No. 42, \$10.50; No. 43, \$12.50.....	70¢ & 10¢ & 5¢
Stanley's Excelsior.....	
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$6.50.....	30¢ & 10¢

## Axes—

First quality.....	50¢ & 50¢ & 50¢
Others.....	50¢ & 50¢ & 50¢

## Axle Grease—

Fraser's.....	1/2 doz \$4.00, 1/2 doz \$4.00, 1/2 doz \$4.00
Fraser's, in boxes.....	\$7.50.....
Dixon's Everlasting, in bx.....	1 doz \$2.00
Dixon's Everlasting.....	10 lb. pails, ea. 85¢
Lower grades, special brands.....	1/2 doz \$5.00 & \$7.00

## Axles—

No. 1.....	4¢ & 4¢ & 4¢
No. 2.....	5¢ & 5¢ & 5¢
No. 3.....	7¢ & 7¢ & 7¢
No. 4.....	10¢ & 10¢ & 10¢
No. 5.....	15¢ & 15¢ & 15¢
No. 6.....	20¢ & 20¢ & 20¢
No. 7.....	25¢ & 25¢ & 25¢
No. 8.....	30¢ & 30¢ & 30¢
No. 9.....	35¢ & 35¢ & 35¢
No. 10.....	40¢ & 40¢ & 40¢
No. 11.....	45¢ & 45¢ & 45¢
No. 12.....	50¢ & 50¢ & 50¢
No. 13.....	55¢ & 55¢ & 55¢
No. 14.....	60¢ & 60¢ & 60¢
No. 15.....	65¢ & 65¢ & 65¢
No. 16.....	70¢ & 70¢ & 70¢
No. 17.....	75¢ & 75¢ & 75¢
No. 18.....	80¢ & 80¢ & 80¢
No. 19.....	85¢ & 85¢ & 85¢
No. 20.....	90¢ & 90¢ & 90¢
No. 21.....	95¢ & 95¢ & 95¢
No. 22.....	1.00 & 1.00 & 1.00
No. 23.....	1.05 & 1.05 & 1.05
No. 24.....	1.10 & 1.10 & 1.10
No. 25.....	1.15 & 1.15 & 1.15
No. 26.....	1.20 & 1.20 & 1.20
No. 27.....	1.25 & 1.25 & 1.25
No. 28.....	1.30 & 1.30 & 1.30
No. 29.....	1.35 & 1.35 & 1.35
No. 30.....	1.40 & 1.40 & 1.40
No. 31.....	1.45 & 1.45 & 1.45
No. 32.....	1.50 & 1.50 & 1.50
No. 33.....	1.55 & 1.55 & 1.55
No. 34.....	1.60 & 1.60 & 1.60
No. 35.....	1.65 & 1.65 & 1.65
No. 36.....	1.70 & 1.70 & 1.70
No. 37.....	1.75 & 1.75 & 1.75
No. 38.....	1.80 & 1.80 & 1.80
No. 39.....	1.85 & 1.85 & 1.85
No. 40.....	1.90 & 1.90 & 1.90
No. 41.....	1.95 & 1.95 & 1.95
No. 42.....	2.00 & 2.00 & 2.00
No. 43.....	2.05 & 2.05 & 2.05
No. 44.....	2.10 & 2.10 & 2.10
No. 45.....	2.15 & 2.15 & 2.15
No. 46.....	2.20 & 2.20 & 2.20
No. 47.....	2.25 & 2.25 & 2.25
No. 48.....	2.30 & 2.30 & 2.30
No. 49.....	2.35 & 2.35 & 2.35
No. 50.....	2.40 & 2.40 & 2.40
No. 51.....	2.45 & 2.45 & 2.45
No. 52.....	2.50 & 2.50 & 2.50
No. 53.....	2.55 & 2.55 & 2.55
No. 54.....	2.60 & 2.60 & 2.60
No. 55.....	2.65 & 2.65 & 2.65
No. 56.....	2.70 & 2.70 & 2.70
No. 57.....	2.75 & 2.75 & 2.75
No. 58.....	2.80 & 2.80 & 2.80
No. 59.....	2.85 & 2.85 & 2.85
No. 60.....	2.90 & 2.90 & 2.90
No. 61.....	2.95 & 2.95 & 2.95
No. 62.....	3.00 & 3.00 & 3.00
No. 63.....	3.05 & 3.05 & 3.05
No. 64.....	3.10 & 3.10 & 3.10
No. 65.....	3.15 & 3.15 & 3.15
No. 66.....	3.20 & 3.20 & 3.20
No. 67.....	3.25 & 3.25 & 3.25
No. 68.....	3.30 & 3.30 & 3.30
No. 69.....	3.35 & 3.35 & 3.35
No. 70.....	3.40 & 3.40 & 3.40
No. 71.....	3.45 & 3.45 & 3.45
No. 72.....	3.50 & 3.50 & 3.50
No. 73.....	3.55 & 3.55 & 3.55
No. 74.....	3.60 & 3.60 & 3.60
No. 75.....	3.65 & 3.65 & 3.65
No. 76.....	3.70 & 3.70 & 3.70
No. 77.....	3.75 & 3.75 & 3.75
No. 78.....	3.80 & 3.80 & 3.80
No. 79.....	3.85 & 3.85 & 3.85
No. 80.....	3.90 & 3.90 & 3.90
No. 81.....	3.95 & 3.95 & 3.95
No. 82.....	4.00 & 4.00 & 4.00
No. 83.....	4.05 & 4.05 & 4.05
No. 84.....	4.10 & 4.10 & 4.10
No. 85.....	4.15 & 4.15 & 4.15
No. 86.....	4.20 & 4.20 & 4.20
No. 87.....	4.25 & 4.25 & 4.25
No. 88.....	4.30 & 4.30 & 4.30
No. 89.....	4.35 & 4.35 & 4.35
No. 90.....	4.40 & 4.40 & 4.40
No. 91.....	4.45 & 4.45 & 4.45
No. 92.....	4.50 & 4.50 & 4.50
No. 93.....	4.55 & 4.55 & 4.55
No. 94.....	4.60 & 4.60 & 4.60
No. 95.....	4.65 & 4.65 & 4.65
No. 96.....	4.70 & 4.70 & 4.70
No. 97.....	4.75 & 4.75 & 4.75
No. 98.....	4.80 & 4.80 & 4.80
No. 99.....	4.85 & 4.85 & 4.85
No. 100.....	4.90 & 4.90 & 4.90

## Bag Holders—

Sprengle's Pat.....	1/2 doz \$18.....
---------------------	-------------------

## Balances—

Spring Balances.....	50¢
Common 24 lb.....	1/2 doz \$1.50.....
Chatillon's Spring Balances.....	50¢
Chatillon's Circular Spring Balances.....	60¢

## Bells—

Hand—

Light Brass.....	70¢ & 10¢ & 75¢
Extra Heavy.....	60¢ & 10¢
White Metal.....	60¢ & 10¢ & 10¢
Silver Chime.....	35¢ & 10¢
Globe (Cone's Patent).....	25¢ & 10¢ & 35¢

## Door—

Gong, Abbe's.....	35¢ & 10¢
Gong, Yankee.....	45¢ & 10¢
Gong, Barton's.....	40¢ & 10¢ & 50¢
Crank, Taylor's.....	25¢ & 10¢
Crank, Brooks'.....	60¢ & 10¢ & 20¢
Crank, Cone's.....	10¢





**Cross-Cut Saw Handles—**  
Atkins' No. 1 Loop, pair, 28¢; No. 3, 18¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.  
Boynton's Loop Saw Handles, 50¢... 60¢  
Champion..... 15¢

**Hangers—**  
Barn Door, old patterns..... 60¢10¢10¢70¢  
Barn Door, New England..... 60¢10¢10¢70¢  
Samson Steel Anti-Friction..... 55¢  
Orleans Steel..... 55¢  
Hamilton Wrought Wood Track..... 55¢  
U. S. Wood Track..... 55¢  
Champion..... 60¢10¢  
Rider and Wooster, Medina Mfg. Co.'s..... 70¢  
Ist..... 70¢  
Climax Anti-Friction..... 60¢  
Istmax Anti-Friction for Wood Track..... 55¢  
Zenith for Wood Track..... 55¢  
ed's Steel Arm..... 50¢  
allenge, Barn Door..... 50¢  
Sterling's Imp'ved (Anti-Friction) 65¢10¢  
Victor, No. 1, \$15.00; No. 2, \$10.50; No. 3, \$18.00..... 50¢23¢  
Cheriffree..... 50¢10¢  
Kiddier..... 50¢10¢60¢  
The Boss..... 60¢10¢  
Best Anti-Friction..... 60¢10¢  
Duplex (Wood Track)..... 60¢10¢5¢  
Terry's Pat., ½ doz pr. 4 in, \$10.00; 5 in, \$12.00..... 50¢56¢10¢10¢  
Cronk's Pat., No. 4, \$12.00; No. 5, \$14.00; No. 6, \$18.00..... 50¢15¢60¢  
Wood Track Iron Clad, ½ ft. 10¢..... 60¢10¢60¢  
Carrier Steel Anti-Friction..... 50¢60¢5¢  
Architect, ½ set \$6.00..... 20¢10¢  
Eclipse..... 20¢10¢  
Felix, ½ set \$4.50..... 20¢  
Richards..... 30¢30¢10¢  
Lane's Steel Anti-Friction..... 50¢  
Ball Bearing Door Hanger..... 20¢10¢25¢10¢  
Warner's Pat..... 30¢20¢10¢  
Stearns' Anti-Friction..... 30¢20¢10¢  
Stearns' Challenge..... 25¢10¢25¢10¢10¢  
Faultless..... 40¢40¢5¢  
American, ½ set \$6.00..... 20¢10¢  
Rider & Wooster, No. 1, 62¢; No. 2, 75¢..... 40¢10¢  
Paragon, Nos. 1, 2 and 3..... 40¢10¢  
Paragon, Nos. 5, 5½, 7 and 8..... 20¢10¢  
Crescent..... 60¢60¢10¢  
Nickel, Cast Iron..... 50¢  
Nickel, Malleable Iron and Steel..... 40¢  
Scranton Anti-Friction Single Strap..... 35¢4¢  
Scranton Anti-Friction Double Strap..... 40¢  
Universal Anti-Friction..... 40¢  
Wild West, 4 in. Wheel, \$15.00; 5 in. Wheel, \$21.00..... 45¢  
Star..... 40¢10¢40¢10¢5¢  
May..... 50¢56¢50¢10¢  
Barry, \$6.00..... 40¢10¢

**Harness Snaps—**  
See Snaps.  
**Hatchets—**  
List Jan. 1, 1889..... 35¢40¢  
Isaiah Blood..... 35¢40¢  
Hunt's Shingling, Lath and Claw..... 40¢5¢  
Hunt's Broad..... 40¢  
Buffalo Hammer Co..... 40¢  
Hurd's..... 40¢10¢50¢  
Fayette R. Plumb..... 40¢10¢50¢  
Wm. Mann, Jr., & Co..... 50¢50¢5¢  
Underhill Edge Tool Co..... 40¢50¢40¢10¢  
Underhill's, Haines and Bright..... 35¢4¢  
C. Hammond & Son..... 40¢10¢50¢  
Simmons..... 40¢10¢50¢  
Peck's..... 40¢10¢40¢10¢5¢  
Kelly's..... 50¢50¢5¢  
Sargent & Co..... 50¢  
Ten Eyck Edge Tool Co. 40¢10¢40¢10¢5¢  
Collins..... 10¢  
Schulte, Lohoff & Co..... 50¢50¢5¢  
**Hay and Straw Nives—**  
Lightning Mfrs' price ½ doz \$18.00, 25¢  
But jobbers frequently give extras.  
Gem..... ½ doz \$10  
Wadsworth's..... 40¢75¢40¢10¢  
Carter's Needle..... ½ doz \$11.50¢12.00  
Heath's..... ½ doz \$13.50¢14.00  
Auburn Hay, Corn and Spear Point..... 40¢  
Auburn, Straw..... 40¢  
Noll's Hay..... ½ doz \$10.00

**Hinges—**  
**Wrought Iron Hinges**  
Strap and T..... 75¢5¢75¢10¢  
Screw Hook and 6 to 12 in., ½ doz..... 34¢  
Strap..... 22 to 36 in., ½ doz..... 24¢  
Heavy Welded 6 to 12 in., ½ doz..... 34¢  
Hook..... 22 to 36 in., ½ doz..... 24¢  
Screw Hook ¼ in., ½ doz \$1.50  
and Eye ¾ in., ½ doz \$2.45 10¢  
Rolled Blind Hinges, Nos. 32 and 34..... 50¢10¢  
Rolled Blind Hinges, Nos. 232 and 234..... 50¢10¢  
Rolled Plate..... 70¢10¢  
Rolled Raised..... 70¢10¢  
Plate Hinges, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 422, 424, 426, 428, 430, 432, 434, 436, 438, 440, 442, 444, 446, 448, 450, 452, 454, 456, 458, 460, 462, 464, 466, 468, 470, 472, 474, 476, 478, 480, 482, 484, 486, 488, 490, 492, 494, 496, 498, 500, 502, 504, 506, 508, 510, 512, 514, 516, 518, 520, 522, 524, 526, 528, 530, 532, 534, 536, 538, 540, 542, 544, 546, 548, 550, 552, 554, 556, 558, 560, 562, 564, 566, 568, 570, 572, 574, 576, 578, 580, 582, 584, 586, 588, 590, 592, 594, 596, 598, 600, 602, 604, 606, 608, 610, 612, 614, 616, 618, 620, 622, 624, 626, 628, 630, 632, 634, 636, 638, 640, 642, 644, 646, 648, 650, 652, 654, 656, 658, 660, 662, 664, 666, 668, 670, 672, 674, 676, 678, 680, 682, 684, 686, 688, 690, 692, 694, 696, 698, 700, 702, 704, 706, 708, 710, 712, 714, 716, 718, 720, 722, 724, 726, 728, 730, 732, 734, 736, 738, 740, 742, 744, 746, 748, 750, 752, 754, 756, 758, 760, 762, 764, 766, 768, 770, 772, 774, 776, 778, 780, 782, 784, 786, 788, 790, 792, 794, 796, 798, 800, 802, 804, 806, 808, 810, 812, 814, 816, 818, 820, 822, 824, 826, 828, 830, 832, 834, 836, 838, 840, 842, 844, 846, 848, 850, 852, 854, 856, 858, 860, 862, 864, 866, 868, 870, 872, 874, 876, 878, 880, 882, 884, 886, 888, 890, 892, 894, 896, 898, 900, 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960, 962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000, 1002, 1004, 1006, 1008, 1010, 1012, 1014, 1016, 1018, 1020, 1022, 1024, 1026, 1028, 1030, 1032, 1034, 1036, 1038, 1040, 1042, 1044, 1046, 1048, 1050, 1052, 1054, 1056, 1058, 1060, 1062, 1064, 1066, 1068, 1070, 1072, 1074, 1076, 1078, 1080, 1082, 1084, 1086, 1088, 1090, 1092, 1094, 1096, 1098, 1100, 1102, 1104, 1106, 1108, 1110, 1112, 1114, 1116, 1118, 1120, 1122, 1124, 1126, 1128, 1130, 1132, 1134, 1136, 1138, 1140, 1142, 1144, 1146, 1148, 1150, 1152, 1154, 1156, 1158, 1160, 1162, 1164, 1166, 1168, 1170, 1172, 1174, 1176, 1178, 1180, 1182, 1184, 1186, 1188, 1190, 1192, 1194, 1196, 1198, 1200, 1202, 1204, 1206, 1208, 1210, 1212, 1214, 1216, 1218, 1220, 1222, 1224, 1226, 1228, 1230, 1232, 1234, 1236, 1238, 1240, 1242, 1244, 1246, 1248, 1250, 1252, 1254, 1256, 1258, 1260, 1262, 1264, 1266, 1268, 1270, 1272, 1274, 1276, 1278, 1280, 1282, 1284, 1286, 1288, 1290, 1292, 1294, 1296, 1298, 1300, 1302, 1304, 1306, 1308, 1310, 1312, 1314, 1316, 1318, 1320, 1322, 1324, 1326, 1328, 1330, 1332, 1334, 1336, 1338, 1340, 1342, 1344, 1346, 1348, 1350, 1352, 1354, 1356, 1358, 1360, 1362, 1364, 1366, 1368, 1370, 1372, 1374, 1376, 1378, 1380, 1382, 1384, 1386, 1388, 1390, 1392, 1394, 1396, 1398, 1400, 1402, 1404, 1406, 1408, 1410, 1412, 1414, 1416, 1418, 1420, 1422, 1424, 1426, 1428, 1430, 1432, 1434, 1436, 1438, 1440, 1442, 1444, 1446, 1448, 1450, 1452, 1454, 1456, 1458, 1460, 1462, 1464, 1466, 1468, 1470, 1472, 1474, 1476, 1478, 1480, 1482, 1484, 1486, 1488, 1490, 1492, 1494, 1496, 1498, 1500, 1502, 1504, 1506, 1508, 1510, 1512, 1514, 1516, 1518, 1520, 1522, 1524, 1526, 1528, 1530, 1532, 1534, 1536, 1538, 1540, 1542, 1544, 1546, 1548, 1550, 1552, 1554, 1556, 1558, 1560, 1562, 1564, 1566, 1568, 1570, 1572, 1574, 1576, 1578, 1580, 1582, 1584, 1586, 1588, 1590, 1592, 1594, 1596, 1598, 1600, 1602, 1604, 1606, 1608, 1610, 1612, 1614, 1616, 1618, 1620, 1622, 1624, 1626, 1628, 1630, 1632, 1634, 1636, 1638, 1640, 1642, 1644, 1646, 1648, 1650, 1652, 1654, 1656, 1658, 1660, 1662, 1664, 1666, 1668, 1670, 1672, 1674, 1676, 1678, 1680, 1682, 1684, 1686, 1688, 1690, 1692, 1694, 1696, 1698, 1700, 1702, 1704, 1706, 1708, 1710, 1712, 1714, 1716, 1718, 1720, 1722, 1724, 1726, 1728, 1730, 1732, 1734, 1736, 1738, 1740, 1742, 1744, 1746, 1748, 1750, 1752, 1754, 1756, 1758, 1760, 1762, 1764, 1766, 1768, 1770, 1772, 1774, 1776, 1778, 1780, 1782, 1784, 1786, 1788, 1790, 1792, 1794, 1796, 1798, 1800, 1802, 1804, 1806, 1808, 1810, 1812, 1814, 1816, 1818, 1820, 1822, 1824, 1826, 1828, 1830, 1832, 1834, 1836, 1838, 1840, 1842, 1844, 1846, 1848, 1850, 1852, 1854, 1856, 1858, 1860, 1862, 1864, 1866, 1868, 1870, 1872, 1874, 1876, 1878, 1880, 1882, 1884, 1886, 1888, 1890, 1892, 1894, 1896, 1898, 1900, 1902, 1904, 1906, 1908, 1910, 1912, 1914, 1916, 1918, 1920, 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938, 1940, 1942, 1944, 1946, 1948, 1950, 1952, 1954, 1956, 1958, 1960, 1962, 1964, 1966, 1968, 1970, 1972, 1974, 1976, 1978, 1980, 1982, 1984, 1986, 1988, 1990, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030, 2032, 2034, 2036, 2038, 2040, 2042, 2044, 2046, 2048, 2050, 2052, 2054, 2056, 2058, 2060, 2062, 2064, 2066, 2068, 2070, 2072, 2074, 2076, 2078, 2080, 2082, 2084, 2086, 2088, 2090, 2092, 2094, 2096, 2098, 2100, 2102, 2104, 2106, 2108, 2110, 2112, 2114, 2116, 2118, 2120, 2122, 2124, 2126, 2128, 2130, 2132, 2134, 2136, 2138, 2140, 2142, 2144, 2146, 2148, 2150, 2152, 2154, 2156, 2158, 2160, 2162, 2164, 2166, 2168, 2170, 2172, 2174, 2176, 2178, 2180, 2182, 2184, 2186, 2188, 2190, 2192, 2194, 2196, 2198, 2200, 2202, 2204, 2206, 2208, 2210, 2212, 2214, 2216, 2218, 2220, 2222, 2224, 2226, 2228, 2230, 2232, 2234, 2236, 2238, 2240, 2242, 2244, 2246, 2248, 2250, 2252, 2254, 2256, 2258, 2260, 2262, 2264, 2266, 2268, 2270, 2272, 2274, 2276, 2278, 2280, 2282, 2284, 2286, 2288, 2290, 2292, 2294, 2296, 2298, 2300, 2302, 2304, 2306, 2308, 2310, 2312, 2314, 2316, 2318, 2320, 2322, 2324, 2326, 2328, 2330, 2332, 2334, 2336, 2338, 2340, 2342, 2344, 2346, 2348, 2350, 2352, 2354, 2356, 2358, 2360, 2362, 2364, 2366, 2368, 2370, 2372, 2374, 2376, 2378, 2380, 2382, 2384, 2386, 2388, 2390, 2392, 2394, 2396, 2398, 2400, 2402, 2404, 2406, 2408, 2410, 2412, 2414, 2416, 2418, 2420, 2422, 2424, 2426, 2428, 2430, 2432, 2434, 2436, 2438, 2440, 2442, 2444, 2446, 2448, 2450, 2452, 2454, 2456, 2458, 2460, 2462, 2464, 2466, 2468, 2470, 2472, 2474, 2476, 2478, 2480, 2482, 2484, 2486, 2488, 2490, 2492, 2494, 2496, 2498, 2500, 2502, 2504, 2506, 2508, 2510, 2512, 2514, 2516, 2518, 2520, 2522, 2524, 2526, 2528, 2530, 2532, 2534, 2536, 2538, 2540, 2542, 2544, 2546, 2548, 2550, 2552, 2554, 2556, 2558, 2560, 2562, 2564, 2566, 2568, 2570, 2572, 2574, 2576, 2578, 2580, 2582, 2584, 2586, 2588, 2590, 2592, 2594, 2596, 2598, 2600, 2602, 2604, 2606, 2608, 2610, 2612, 2614, 2616, 2618, 2620, 2622, 2624, 2626, 2628, 2630, 2632, 2634, 2636, 2638, 2640, 2642, 2644, 2646, 2648, 2650, 2652, 2654, 2656, 2658, 2660, 2662, 2664, 2666, 2668, 2670, 2672, 2674, 2676, 2678, 2680, 2682, 2684, 2686, 2688, 2690, 2692, 2694, 2696, 2698, 2700, 2702, 2704, 2706, 2708, 2710, 2712, 2714, 2716, 2718, 2720, 2722, 2724, 2726, 2728, 2730, 2732, 2734, 2736, 2738, 2740, 2742, 2744, 2746, 2748, 2750, 2752, 2754, 2756, 2758, 2760, 2762, 2764, 2766, 2768, 2770, 2772, 2774, 2776, 2778, 2780, 2782, 2784, 2786, 2788, 2790, 2792, 2794, 2796, 2798, 2800, 2802, 2804, 2806, 2808, 2810, 2812, 2814, 2816, 2818, 2820, 2822, 2824, 2826, 2828, 2830, 2832, 2834, 2836, 2838, 2840, 2842, 2844, 2846, 2848, 2850, 2852, 2854, 2856, 2858, 2860, 2862, 2864, 2866, 2868, 2870, 2872, 2874, 2876, 2878, 2880, 2882, 2884, 2886, 2888, 2890, 2892, 2894, 2896, 2898, 2900, 2902, 2904, 2906, 2908, 2910, 2912, 2914, 2916, 2918, 2920, 2922, 2924, 2926, 2928, 2930, 2932, 2934, 2936, 2938, 2940, 2942, 2944, 2946, 2948, 2950, 2952, 2954, 2956, 2958, 2960, 2962, 2964, 2966, 2968, 2970, 2972, 2974, 2976, 2978, 2980, 2982, 2984, 2986, 2988, 2990, 2992, 2994, 2996, 2998, 3000, 3002, 3004, 3006, 3008, 3010, 3012, 3014, 3016, 3018, 3020, 3022, 3024, 3026, 3028, 3030, 3032, 3034, 3036, 3038, 3040, 3042, 3044, 3046, 3048, 3050, 3052, 3054, 3056, 3058, 3060, 3062, 3064, 3066, 3068, 3070, 3072, 3074, 3076, 3078, 3080, 3082, 3084, 3086, 3088, 3090, 3092, 3094, 3096, 3098, 3100, 3102, 3104, 3106, 3108, 3110, 3112, 3114, 3116, 3118, 3120, 3122, 3124, 3126, 3128, 3130, 3132, 3134, 3136, 3138, 3140, 3142, 3144, 3146, 3148, 3150, 3152, 3154, 3156, 3158, 3160, 3162, 3164, 3166, 3168, 3170, 3172, 3174, 3176, 3178, 3180, 3182, 3184, 3186, 3188, 3190, 3192, 3194, 3196, 3198, 3200, 3202, 3204, 3206, 3208, 3210, 3212, 3214, 3216, 3218, 3220, 3222, 3224, 3226, 3228, 3230, 3232, 3234, 3236, 3238, 3240, 3242, 3244, 3246, 3248, 3250, 3252, 3254, 3256, 3258, 3260, 3262, 3264, 3266, 3268, 3270, 3272, 3274, 3276, 3278, 3280, 3282, 3284, 3286, 3288, 3290, 3292, 3294, 3296, 3298, 3300, 3302, 3304, 3306, 3308, 3310, 3312, 3314, 3316, 3318, 3320, 3322, 3324, 3326, 3328, 3330, 3332, 3334, 3336, 3338, 3340, 3342, 3344, 3346, 3348, 3350, 3352, 3354, 3356, 3358, 3360, 3362, 3364, 3366, 3368, 3370, 3372, 3374, 3376, 3378, 3380, 3382, 3384, 3386, 3388, 3390, 3392, 3394, 3396, 3398, 3400, 3402, 3404, 3406, 3408, 3410, 3412, 3414, 3416, 3418, 3420, 3422, 3424, 3426, 3428, 3430, 3432, 3434, 3436, 3438, 3440, 3442, 3444, 3446, 3448, 3450, 3452, 3454, 3456, 3458, 3460, 3462, 3464, 3466, 3468, 3470, 3472, 3474, 3476, 3478, 3480, 3482, 3484, 3486, 3488, 3490, 3492, 3494, 3496, 3498, 3500, 3502, 3504, 3506, 3508, 3510, 3512, 3514, 3516, 3518, 3520, 3522, 3524, 3526, 3528, 3530, 3532, 3534, 3536, 3538, 3540, 3542, 3544, 3546, 3548, 3550, 3552, 3554, 3556, 3558, 3560, 3562, 3564, 3566, 3568, 3570, 3572, 3574, 3576, 3578, 3580, 3582, 3584, 3586, 3588, 3590, 3592, 3594, 3596, 3598, 3600, 3602, 3604, 3606, 3608, 3610

**Molasses Gates—**

Stebbin's Pat.	70¢ 70¢ 71¢
Stebbin's Genuine	60¢ 10¢ 10¢
Stebbin's Tinned Ends	40¢ 10¢
Chase's Hard Metal	50¢ 10¢
Bush's	20¢
Lincoln's Pattern	70¢ 70¢ 10¢
Weed's	20¢ 10¢

**Boss, # doz:**

Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10	60¢ 10¢ 10¢
------------------------------------	-------------

**Money Drawers—**

# doz, \$18 to \$20	
---------------------	--

**Muzzles—**

Safety	# doz, \$3.00, 25¢
--------	--------------------

**Nails, see Trade Report.**

Wire Nails, Papered.	
----------------------	--

See Trade Report.	
-------------------	--

Tack Mfrs.' list.	70¢ 10¢
-------------------	---------

Wire Nails, Standard Penny.	
-----------------------------	--

Card June 1, '89, base.	\$2.40 to \$2.50
-------------------------	------------------

**Nail Puller—**

Curtiss Hammer	# doz \$9.00
----------------	--------------

Glant, No. 1.	# doz \$30.00, 10¢
---------------	--------------------

Pelican.	# doz \$9.00, 25¢
----------	-------------------

Boss	# doz \$30.00, 30¢
------	--------------------

Lightning.	# doz \$21.00
------------	---------------

**Nail Sets—**

Square.	# gr, \$4.00 to \$4.25
---------	------------------------

Round.	# gr, \$3.25
--------	--------------

Cannon's Diamond Point.	# gr, \$12, 20¢
-------------------------	-----------------

**Nut Crackers—**

Table (H. & B. Mfg. Co.)	40¢
--------------------------	-----

Blake's Pattern.	# doz \$2.00, 10¢
------------------	-------------------

Turner & Seymour Mfg. Co.	50¢
---------------------------	-----

**Nuts—**

Nuts, off list Jan. 1, 1888: Square. Hex.	
---	--

Hot Pressed.	5.4¢ 5.9¢
--------------	-----------

Cold Punched.	5.4¢ 5.5¢
---------------	-----------

In lots less than 100 lb.	#, add 1¢; 1-lb boxes, add 1¢ to list.
---------------------------	--

**Oil—**

Government.	# 7½ 68¢
-------------	----------

U. S. Navy.	# 68¢ 67¢
-------------	-----------

Navy.	# 54¢ 64¢
-------	-----------

**Oilers—**

Zinc and Tin	65¢ 65¢ 10¢
--------------	-------------

Brass and Copper	50¢ 10¢ 10¢
------------------	-------------

Malleable, Hammers, Improved, No. 1.	\$3.90; No. 2, \$4.00; No. 3, \$4.10 # doz.
--------------------------------------	---

Malleable, Hammers, Old Pattern, same list	10¢ 10¢ 10¢
--	-------------

Prior's Pat. or "Paragon" Zinc	40¢
--------------------------------	-----

Prior's Pat. or "Paragon" Brass	60¢
---------------------------------	-----

Olmstead's Tin and Zinc	60¢
-------------------------	-----

Olmstead's Brass and Copper	60¢
-----------------------------	-----

Broughton's Zinc	60¢
------------------	-----

Broughton's Brass	60¢
-------------------	-----

Gem. P. D. & Co.	# gro, \$2
------------------	------------

**Packing, Steam—**

Rubber	
--------	--

Standard	60¢ 10¢ 10¢ 10¢ 10¢
----------	---------------------

Extra	50¢ 10¢ 10¢
-------	-------------

N. Y. B. & P. Co., Standard	60¢ 10¢ 5¢
-----------------------------	------------

N. Y. B. & P. Co., Empire	70¢
---------------------------	-----

N. Y. B. & P. Co., Salamander	70¢
-------------------------------	-----

Jenkins' Standard	# 65¢, 30¢
-------------------	------------

Miscellaneous—	
----------------	--

American Packing	10¢ 11¢ #
------------------	-----------

Russian Packing	14¢ #
-----------------	-------

Italian Packing	13¢ 14¢ #
-----------------	-----------

Cotton Packing	15¢ 17¢ #
----------------	-----------

Jute	7¢ 8¢ #
------	---------

**Padlocks—**

See Locks.	
------------	--

**Pails—**

Galvanized Iron—	
------------------	--

Quarts	10 12 14
--------	----------

Hill's Light Weight, # doz	\$2.75 3.00 3.25
----------------------------	------------------

Hill's Heavy Weight, # dz	3.00 3.25 3.75
---------------------------	----------------

Whiting's	2.75 3.00 3.25
-----------	----------------

Sidney Shepard & Co.	2.80 3.00 3.40
----------------------	----------------

Iron Clad	2.75 3.00 3.25
-----------	----------------

Fire Buckets	2.75 3.25 3.50
--------------	----------------

Buckets, see Well Buckets.	
----------------------------	--

Indurated Fibre Ware—25¢	
--------------------------	--

Star Pails, 12 qt.	# doz \$4.00
--------------------	--------------

Fire, Stable and Milk, 14 qt.	# doz \$7.80
-------------------------------	--------------

Standard Fibre Ware—	
----------------------	--

Water Pails, 12 qt., per doz.	\$4.50
-------------------------------	--------

Dairy Pails, 14 qt., per doz.	4.50
-------------------------------	------

Fire Pails, No. 1, 12 qt. per doz	5.00
-----------------------------------	------

Fire Pails, No. 2, 14 qt. per doz	4.50
-----------------------------------	------

**Pencils—**

Faber's Carpenters'	high list 50¢
---------------------	---------------

Faber's Round Gill	# gro \$5.25
--------------------	--------------

Dixon's Lead	# gro \$4.50
--------------	--------------

Dixon's Lumber	# gro \$6.75
----------------	--------------

Dixon's Carpenters'	70¢ 10¢
---------------------	---------

**Picks—**

Railroad or Adze Eye, 5 to 6, \$12.00;	
--	--

6 to 7, \$13.00.	50¢ 10¢ 5¢ 60¢
------------------	----------------

**Picture Nails—**

Brass Head, Sargent's list.	50¢ 10¢ 10¢
-----------------------------	-------------

Brass Head, Combination list.	50¢ 10¢
-------------------------------	---------

Porcelain Head, Sargent's list.	50¢ 10¢ 10¢
---------------------------------	-------------

Porcelain Head, Combination list.	40¢ 10¢
-----------------------------------	---------

Niles' Patent.	40¢
----------------	-----

**Pinking Irons—**

# doz 65¢ net	
---------------	--

**Pipe, Wrought Iron—**

List March 23, 1887.	
----------------------	--

14 and under, Plain	50¢
---------------------	-----

14 and under, Galvanized	42½¢
--------------------------	------

1½ and over, Plain	62½¢
--------------------	------

1½ and over, Galvanized	50¢
-------------------------	-----

Bolter Tubes, Iron	
--------------------	--

13 and under.	52½¢
---------------	------

2 in. and larger.	57½¢
-------------------	------

**Planes and Plane Irons—**

Wood Planes—	
--------------	--

Molding	50¢ 50¢ 50¢ 10¢
---------	-----------------

Arch, First Quality	60¢ 60¢ 5¢
---------------------	------------

Bench, Second Quality	60¢ 10¢ 60¢ 10¢ 10¢
-----------------------	---------------------

Bailey's (Stanley R. & L. Co.)	40¢ 10¢
--------------------------------	---------

Iron Planes—	
--------------	--

Bailey's (Stanley R. & L. Co.)	65¢
--------------------------------	-----

Miscellaneous Planes (Stanley R. & L. Co.)	20¢ 10¢
--	---------

Victor Planes (Stanley R. & L. Co.)	20¢ 10¢
-------------------------------------	---------

Steer's Iron Planes	35¢ 35¢ 5¢
---------------------	------------

Meriden Mfg. Iron Co.'s	30¢ 10¢ 30¢ 10¢ 10¢
-------------------------	---------------------

Davis's Iron Planes	30¢ 10¢ 30¢ 10¢ 10¢
---------------------	---------------------

**Birmingham Plane Co.**

Gage Tool Co.'s Self-Setting	20¢ 10¢
------------------------------	---------

Chaplin's Iron Planes	40¢ 40¢ 5¢
-----------------------	------------

Sargent's	30¢ 10¢ 30¢ 10¢ 10¢
-----------	---------------------

**Plane Irons—**

Plane Irons	20¢ 10¢
-------------	---------

Plane Irons, Butcher's	\$5.00 to \$5.25 10¢
------------------------	----------------------

Plane Irons, Buck Bros	30¢
------------------------	-----

Plane Irons, Auburn Tool Co., "This- tite"	40¢
---	-----

Sandusky Tool Co.	30¢
-------------------	-----

Single and Cut	40¢
----------------	-----

Double	40¢
--------	-----

L. & J. White	25¢
---------------	-----

**Pliers and Nippers—**

Button's Patent	30¢ 10¢ 40¢
-----------------	-------------

Hall's No. 2, 5 in.	\$13.50; No. 4, 7 in.
---------------------	-----------------------

\$21.00 # doz	20¢ 10¢ 35¢
---------------	-------------

Humason & Beckley Mfg. Co.	50¢ 50¢ 10¢
----------------------------	-------------

Gas Pliers, Custer's Nickel Plated	60¢
------------------------------------	-----

Eureka Pliers and Nippers	40¢
---------------------------	-----

Russell's Parallel	25¢
--------------------	-----

P. S. & W. Cast Steel	50¢
-----------------------	-----

P. S. & W. Tinner's Cutting Nippers	add 6¢ dis 10¢
-------------------------------------	----------------

Carew's Pat. Wire Cutters	20¢
---------------------------	-----

Morrill's Parallel, # doz	\$12.00, 30¢ 5¢
---------------------------	-----------------

Cronk's 8 in., \$15.00; 10 in.	\$21.00, 40¢ 40¢ 5¢
--------------------------------	---------------------

**Plumbs and Levels—**

Regular List	70¢ 10¢ 70¢ 10¢ 10¢
--------------	---------------------

Disston's	45¢ 10¢
-----------	---------

Pocket Levels	70¢ 10¢ 70¢ 10¢ 10¢
---------------	---------------------

Davis Iron Levels	30¢
-------------------	-----

Davis' Inclinoimeters	10¢ 10¢
-----------------------	---------

**Polish, Metal.**

Prestolite	20¢ 10¢
------------	---------

Krestoline Paste	33¢
------------------	-----

Gaston's Silver Compound	33¢
--------------------------	-----

**Pokes, Animal.**

Bishop's I. X. L.	# doz \$6.50
-------------------	--------------

Bishop's O. K.	# doz \$5.50
----------------	--------------

Bishop's Pioneer	# doz \$3.75
------------------	--------------

Bishop's American	# doz \$3.00
-------------------	--------------

**Poppers, Corn.**

Round or Square, 1 qt.	# gr \$12.00 to \$15.00
------------------------	-------------------------

Round or Square, 2 qt.	# gr \$25.00 to \$20.00
------------------------	-------------------------

**Post Hole and Tree Augers**

Samson Post Hole Digger	# doz \$30.00.
-------------------------	----------------

Fletcher Post Hole Augers	# doz \$30, 20¢
---------------------------	-----------------

Eureka Diggers	# doz \$16.00 to \$17.00
----------------	--------------------------

Leed's	# doz \$8.00 to \$9.00
--------	------------------------

Vaughan's Post Hole Auger	# doz \$60.00
---------------------------	---------------

Kohler's Little Giant	# doz \$18.00
-----------------------	---------------

Kohler's Hercules	# doz \$15.00
-------------------	---------------

Kohler's New Champion	# doz \$9.00
-----------------------	--------------

Schneider	# doz \$18.00
-----------	---------------

Ryan's Post Hole Diggers	# doz \$24.00
--------------------------	---------------

Cronk's Post Holes	# doz \$30.00
--------------------	---------------

Gibbs Post Hole Digger	# doz \$30.00, 50¢
------------------------	--------------------

Imperial	# doz \$15.
----------	-------------

**Potato Parers—**

White Mountain	# doz \$5.00 to \$5.50
----------------	------------------------

Antrim Combination	# doz \$8.00
--------------------	--------------

Hoosier	# doz \$13.50
---------	---------------

**Pruning Hooks and Shears—**

Disston's Combined Pruning Hook and Saw	# doz \$18.00, 30¢ 10¢
--	------------------------

Disston's Pruning Hook	# doz \$12.00
------------------------	---------------

E. S. Lee & Co.'s Pruning Tools	40¢
---------------------------------	-----

Pruning Shears, Henry's Pat.	# doz
------------------------------	-------

Henry's Pruning Shears	\$3.75 to \$4.00 net
------------------------	----------------------

Wheeler, M. & C. Co.'s Combination	# doz \$12.00, 20¢
------------------------------------	--------------------



<b>Machine—</b>		<b>Spoke Shaves—</b>		<b>Swedes Steel (Swedes Iron price list)</b>		<b>Vices—</b>	
Flat Head, Iron.....	55¢	Iron.....	45¢	Copper Tacks.....	80¢/80¢5	Solid Box.....	60¢/60¢5
Round Head, Iron.....	50¢	Wood.....	30¢	Copper Finishing, Trunk and Clout	50¢/10¢	Parallels—	
<b>Bench and Hand—</b>		Bailey's (Stanley R. & L. Co.).....	40¢/10¢	Nails.....	50¢/10¢	Fisher & Norris Double Screw.....	15¢/10¢
Bench, Iron.....	55¢/10¢/55¢/10¢/10¢	Stearns.....	20¢/10¢/30¢	Finishing Nails.....	70¢/10¢/70¢/10¢/5	Stephens.....	25¢/30¢
Bench, Wood, Beech.....	20¢/10¢	<b>Spoke Trimmers—</b>		Trunk and Clout Nails.....	70¢/10¢/70¢/10¢/5	Parker's.....	20¢/25¢
Bench, Wood, Hickory.....	20¢/10¢	Bonney's.....	50¢/10¢/50¢	Tinned Trunk and Clout Nails.....	70¢/10¢	Wilson's.....	55¢
Hand, Wood.....	25¢/10¢/25¢/10¢/5	Stearns.....	20¢/10¢	Common and Patent Brads.....	70¢/10¢/70¢/10¢/5	Howard's.....	40¢
Lag, Blunt Point.....	75¢/75¢/10¢	Ives', No. 1, \$15.00; No. 2, \$12.00	50¢/10¢	Basket Nails.....	70¢/10¢/70¢/10¢/5	Bonney's.....	40¢/10¢
Coach and Lag, Gimlet Point.....	75¢	Douglas.....	50¢/10¢	Hungarian Nails.....	70¢/10¢/70¢/10¢/5	Millers Falls.....	40¢/40¢/10¢
Bed.....	25¢/5	<b>Spoons and Forks—</b>		Chair Nails.....	70¢/10¢/70¢/10¢/5	Trenton.....	40¢/50¢/40¢/10¢
Hand Nail, Sargent's.....	60¢/10¢	<b>Tinned Iron—</b>		Zinc Glaziers' Points.....	50¢/50¢/5	Merrill's.....	15¢/20¢
Hand Nail, H. & B. Mfg. Co.....	70¢/10¢/75¢	Basting, Cen. Stamp. Co.'s list.....	70¢/10¢	Wire Carpet Nails.....	50¢/50¢/5	Sargent's.....	60¢/10¢/10¢
Hand Nail, Am. Screw Co.....	75¢	Solid Table and Tea, Cen. Stamp. Co.'s	70¢/10¢	Clear Box Nails.....	50¢/10¢/50¢/10¢/5	Backus and Union.....	40¢
Jack Screws, Millers Falls list.....	50¢/50¢/5	Buffalo S. S. & Co.....	35¢/25¢	Picture-Frame Points.....	50¢/10¢/50¢/10¢/5	Double Screw Leg.....	15¢/10¢
Jack Screws, F. S. & W.....	35¢	<b>Silver-Plated—</b> (4 mos. or 5¢ cash 30 days)		Looking Glass Tacks.....	50¢/10¢/50¢/10¢/5	Prentiss.....	20¢/25¢
Jack Screws, Sargent.....	60¢/10¢/60¢/10¢/5	Meriden Brit. Co., Rogers.....	50¢	Leathered Carpet.....	50¢/10¢/50¢/10¢/5	Simpson's Adjustable.....	20¢
Jack Screws, Stearns.....	40¢/40¢/10¢	C. Rogers & Bros.....	50¢	Brush Tacks.....	50¢/10¢/50¢/10¢/5	<b>Saw Filers—</b>	
<b>Scroll Saws—</b>		Reed & Barton.....	50¢	Shoe Finders, List Jan. 2, 1888.....	10¢/10¢	Bonney's, Nos. 2 & 3, \$15.00.....	40¢/10¢
Lester, complete, \$10.00.....	25¢	Wm. Rogers Mfg. Co.....	50¢/10¢/60¢	<b>Tap Borers—</b>		Stearns.....	35¢/35¢
Rogers, complete, \$4.00.....	25¢	Simpson, Hall, Miller & Co.....	50¢/10¢	Common and Kind.....	20¢/10¢	Stearns' Silent Saw Vices.....	35¢/35¢
Barnes' Builders' and Cabinet Makers' \$15.....	25¢	Holmes & Edwards Silver Co.....	50¢/10¢	Ive's Tap Borers.....	30¢/35¢	Sargent's.....	60¢/10¢
Barnes' Scroll Saw Blades.....	35¢	No. 30 Silver Metal.....	50¢/10¢	Japanned.....	20¢/10¢/10¢	Hopkins.....	50¢/10¢
<b>Scythe Snaths.....</b>	<b>50¢/25¢</b>	No. 24 German Silver.....	50¢/10¢	Double-Pointed Tacks.....	85¢	Reading.....	40¢/10¢
<b>Shears—</b>		No. 50 Nickel Silver.....	50¢/10¢	Wire Brads & Nails, Wire, Steel-Wire Brads, R. & E. Mfg. Co.'s list.....	50¢/10¢	Wentworth.....	20¢/10¢
American (Cast) Iron.....	75¢/10¢/75¢/10¢/5	No. 49 Nickel Silver.....	50¢/10¢	<b>Tap Borers—</b>		Combination Hand Vices.....	\$42.00
Pruning.....	See Pruning Hooks and Shears.	German Silver.....	50¢/10¢	Common and Kind.....	20¢/10¢	Cowell Hand Vices.....	20¢
Barnard's Lamp Trimmers.....	50¢/10¢/5	German Silver, Hall & Elton.....	50¢/10¢	Enterprise Mfg. Co.....	20¢/10¢/30¢	Bauer's Pipe Vices.....	10¢
Tinners.....	20¢/25¢	Nickel Silver.....	50¢/10¢	Clark's.....	35¢/35¢	<b>Wagon Boxes—</b>	
Seymour's, List, Dec. 1881.....	60¢/10¢/10¢/10¢/10¢/5	Britannia.....	60¢	<b>Tapes, Measuring—</b>		Per m.....	25¢
Heinisch's, List, Dec. 1881.....	60¢/10¢/10¢/10¢/10¢/5	Boardman's Nickel Silver.....	50¢	American.....	25¢/10¢	<b>Wagon Jacks—</b>	
Heinisch's Tailor's Shears.....	35¢/35¢	Boardman's Britannia Spoons, case lots.....	60¢	Spring.....	40¢	Daisy.....	25¢
First quality C. S. Trimmers.....	80¢/80¢/10¢	<b>Springs—</b>		Chesterman's, Regular list.....	25¢/30¢	<b>Washer Cutters—</b>	
Second quality C. S. Trimmers.....	80¢/80¢/10¢/10¢	Elliptic, Concord, Platform and Half Scroll.....	60¢/60¢/5	<b>Thermometers—</b>		Smith's Pat.....	50¢/10¢/10¢
Acme Cast Shears.....	10¢/10¢	Cliff's Bolster Springs.....	25¢	Tin Case.....	80¢/80¢/10¢	Johnson's.....	\$11.00, 33¢
Diamond Cast Shears.....	10¢	<b>Squares—</b>		<b>Thimble Skeins—See Skeins.</b>		Penny's, 3 doz Pol. \$14; Jap'd, \$16.00, 55¢	
Clipper.....	10¢/10¢	Steel and Iron.....	75¢/10¢/80¢	<b>Ties, Bale—Steel</b>		Appleton's.....	\$16.00, 60¢/10¢
Victor Cast Shears.....	75¢/10¢/75¢/10¢/5	Nickel-Plated.....	60¢/10¢/60¢/10¢	Standard Wire, list.....	50¢/10¢/5	Bonney's.....	30¢/10¢
Howe Bros. & Hulbert, Solid Forged Steel.....	40¢	Try Square and T Bevels.....	60¢/10¢/60¢/10¢	<b>Tinners' Shears, &amp;c.—</b>		<b>Washers—</b>	
Chicago Drop Forge & F. Co. Solid Steel Forged.....	60¢	Diston's Try Square and T Bevels.....	45¢/10¢	Shears and Snips (P. S. & W.).....	20¢/25¢	Size.....	1/8 5-16 3/8 1/2 3/4 1
Clauss Shear Co., Japanned.....	70¢	Winterbottom's Try and Miter.....	30¢/10¢	Punches, see Punches.....	35¢/35¢	Washers.....	6 5/8 5 3/4 3 3/4 3 1/2 3
Clauss Shear Co., Nickle, same list.....	70¢	Starrett's Micrometer Caliper Squares.....	25¢	Snips, J. Mallinson & Co.....	35¢/35¢	In lots less than 200 lb, 5¢, add 1/4¢, 5¢ boxes 1¢ to list.	
<b>Sheaves—</b>		Avery's Flush Bevel Squares.....	25¢	<b>Tinware—</b>		<b>Wedges—</b>	
<b>Sliding Door—</b>		Avery's Level Protractor.....	50¢	Stamped, Japanned and Piced, list Jan. 20 1887.....	75¢/75¢/5	Iron.....	3¢/6¢
M. W. Co., list Dec. 18, 1885.....	50¢/10¢/50¢/10¢	<b>Standard Fibre Ware—</b>		Jan. 20 1887.....	75¢/75¢/5	Steel.....	3¢/4¢
R. & E., list Dec. 18, 1885.....	55¢/20¢	Per Dozen.....		<b>Tire Benders, Upsetters, &amp;c.—</b>		<b>Well Buckets, Galvanized—</b>	
Corbin's list.....	60¢/10¢/25¢	Plain, Dec'r'd.....		Stoddard's Lightning Tire Upsetters.....	15¢	Hill's.....	12 qt, \$4.25; 14 qt, \$5.25
Patent Roller.....	60¢/10¢/25¢	Wash-Basins, 10 1/2 in.....	\$2.00	Tire Perfecting Tire Bender.....	15¢	Iron Clad.....	12 qt, \$4.25; 14 qt, \$5.25
Patent Roller, Hatfield's.....	75¢	Wash-Basins, 12 in.....	2.25	<b>Tobacco Cutters—</b>		Whiting's Flat Iron Band.....	\$4.25; 4.50
Russell's Anti-Friction, list Dec. 18, 1885.....	60¢/25¢	Keelers, 11 1/4 in.....	4.00	Champion.....	20¢/10¢/30¢	Whiting's Wired Top.....	\$4.00; 4.25
Moore's Anti-Friction.....	50¢	Cuspidors.....	8.00	Wood Bottom.....	50¢/10¢/30¢	<b>Well Wheels—</b>	
<b>Sliding Shutter—</b>		Spittoons, "Daisy," 8 in.....	4.00	All Iron.....	50¢/10¢/30¢	8 in.....	\$2.25; 10 in., \$2.70; 12 in., \$3.25
R. & E. list Dec. 18, 1885.....	60¢/10¢/25¢	Peck Measure.....	4.00	Nashua Lock Co.'s 5 doz, \$18.00 50¢/55¢		<b>Wire—</b>	
Sargent's list.....	60¢/10¢/25¢	Half-Peck Measure.....	3.50	Wilson's.....	55¢	Iron—	
Reading list.....	60¢/10¢/10¢	See also Falls.....		Sargent's.....	55¢	Br. & Ann., Nos. 0 to 18.....	70¢/10¢/75¢
<b>Ship Tools—</b>		<b>Staples—</b>		Acme.....	50¢/10¢/40¢	Cop'd, Nos. 0 to 18.....	70¢/70¢/5
L. & J. White.....	20¢/5¢	Fence Staples, Galvanized.....	Same price	<b>Transom Lifters—</b>		Galv., Nos. 0 to 18.....	55¢/55¢
Albertson Mfg. Co.....	25¢	Fence Staples, Plain.....	See Trl. Rep.	Wollensak's.....		Tin'd, Tinned list Nos. 0 to 18.....	67¢/5
<b>Shoes, Horse, Mule, &amp;c.—</b>		<b>Steelyards.....</b>	<b>40¢/10¢/50¢</b>	Class 3 and 4, Bronzed Iron.....	25¢	Stone.....	
<b>Horse—</b>		<b>Stocks and Dies—</b>		Class 3 and 4, Bronze Metal.....	25¢	Br. and Ann'd, Nos. 16 to 18, 72¢/5	
Burden's, Perkins', Phoenix, at factory, \$4.00		Blacksmith's.....		Class 3 and 4, Brass.....	35¢	Bright and Ann'd, Nos. 19 to 23, 75¢/5	
<b>Mule—</b>		Waterford Goods.....	30¢/50¢/30¢/10¢	Skylight Lifters.....	35¢	Br. and Ann'd, Nos. 27 to 38, 75¢/10¢/5	
Add \$1 1/2 keg to above prices.		Butterfield's Goods.....	30¢/50¢/30¢/10¢	Crown, Eagle and Shield.....	50¢	Tinned Broom Wire.....	70¢/60¢/10¢
<b>Or, Wrought—</b>		Lightning Screw Plate.....	25¢/30¢	Reiher's, list Jan. 1, 1887.....	50¢/10¢/2	Galvanized Fence.....	65¢
Ton lots.....	1000 lb lots.....	Reece's New Screw Plates.....	35¢/50¢/40¢	Bronzed Iron Rods.....	50¢/10¢/2	Ann'd Fence, Nos. 8 and 9.....	75¢
500 lb lots.....	1000 lb lots.....	Reversible Ratchet.....	30¢	Brass, Real Bronze or Nickel Plate.....	50¢/10¢/25	Ann'd Grape, Nos. 10 to 14.....	75¢
<b>Shot—</b>		<b>Stone—</b>		Shaw's.....	50¢/10¢	Brass, list Jan. 18, 1884.....	15¢/20¢
(Eastern prices 2¢ off, cash, 5 days.)		Hindostan No. 1, 3¢; Axe, 3¢/4¢; Slips No. 1, 4¢/5¢		Payson's Universal.....	40¢/40¢/10¢	Copper, list Jan. 18, 1884.....	30¢/35¢
Drop, 5 bag, 25 lb.....	\$1.25	Sand Stone.....	2¢/4¢	<b>Traps—</b>		Barb Fence.....	See Trade Report
Drop, 5 bag, 5 lb.....	.30	Washita Stone, Extra.....	10¢/20¢	Game.....		Wire on Spools.....	65¢
Buck and Chilled, 5 lb bag.....	1.50	Washita Stone, No. 1.....	14¢/15¢	Newhouse.....	35¢/40¢/5	Mallin's Steel and Tin'd Wire on Spools.....	40¢
Buck and Chilled, 5 lb bag.....	.35	Washita Stone, No. 2.....	10¢/11¢	Game, Blake's Patent.....	40¢/10¢/5	Wire Clothes Lines, see Lines.	
<b>Shovels and Spades—</b>		Washita Slips, No. 1, Extra.....	30¢/35¢	Mouse and Rat.....		<b>Wire Cloth, Netting, &amp;c.—</b>	
Ames' Shovels, Spades, &c., list Nov. 1, 1885.....	20¢	Washita Slips, No. 1.....	24¢/25¢	Mouse Wood, Choker, 5 doz holes, 11¢/12¢		Painted Screen Cloth, good quality.....	100 sq. ft., \$1.80; 60 sq. ft., \$1.00
NOTE.—Jobbers frequently give 5¢/75¢ extra on above.		Arkansas Stone, No. 1, 4 to 6 in.....	15¢/50	Mouse, Round Wire.....	10¢/10¢	Galvanized Wire Netting.....	75¢/75¢/5
Griffith's Black Iron.....	50¢/10¢	Arkansas Stone, No. 1, 6 to 9 in.....	18¢/85	Mouse, Cage Wire.....	10¢/10¢	<b>Wire Goods—</b>	
Griffith's C. S.....	60¢/60¢/10¢	Turkey Oil Stone, 4 to 8 in.....	10¢/10¢	Mouse, Catch-em-alive.....	15¢	See Bright Wire Goods.	
Griffith's Solid C. S. R. Goods.....	20¢	Turkey Slips.....	10¢/10¢	Mouse, Bonanza.....	10¢/10¢	<b>Wire Rope—</b>	
Old Colony (Sanford Fork & Tool Co.).....	20¢	Lake Superior Chisel.....	10¢/10¢	Rat, Decoy.....	10¢/10¢	List May 1, 1889.....	
St. Louis Shovel Co.....	20¢/20¢/75¢	Lake Superior Slips, Chase.....	31¢/32¢	Hotchkiss Metallic Mouse, 5-hole traps.....	10¢/10¢	Iron.....	30¢
Hussey, Binns & Co.....	15¢/25¢	Seneca Stone, High Rounds.....	20¢/25¢	In full cases.....	50¢/10¢	Cast Steel.....	40¢
Hubbard & Co.....	20¢/20¢/75¢	Seneca Stone, Small Whets.....	20¢/25¢	<b>Trowels—</b>		<b>Wrenches—</b>	
Lehigh Mfg. Co.....	50¢/10¢	<b>Stove Polish—</b>		Lothrop's Brick and Plastering.....	25¢/25¢/5	American Adjustable.....	40¢
Payne Pettibone & Son, list January, 1886.....	30¢	Joseph Dixon's.....	50¢/10¢/10¢	Reed's Brick and Plastering.....	15¢	Baxter's Adjustable "S".....	40¢/10¢/50¢
Remington's Lowman's Fat.....	30¢	Gold Medal.....	50¢/10¢/10¢	Diston's Br'k and Plastering.....	25¢/25¢/10¢	Baxter's Diagonal.....	40¢/10¢/50¢
Rowland's, Black Iron.....	50¢/10¢	Mirror.....	50¢/10¢/10¢	Peace's Plastering.....	25¢	Coe's Genuine.....	55¢/35¢
Rowland's Steel.....	60¢/50¢/60¢/10¢	Lustro.....	50¢/10¢/10¢	Clement & Maynard's.....	20¢	Coe's "Mechanics".....	55¢/10¢/35¢
<b>Shovels and Tongs—</b>		Ruby.....	50¢/10¢/10¢	Rose's Brick.....	15¢/20¢	Girard Standard.....	70¢/10¢
Iron Head.....	60¢/10¢/60¢/10¢/5	Rising Sun, 5 gro lots.....	50¢/10¢/10¢	Brad's Brick.....	25¢	Machinists', Sterling French Co., 70¢/10¢	
Brass Head.....	60¢/10¢/10¢	Dixon's Plumbago.....	50¢/10¢/10¢	Worrall's Brick and Plastering.....	20¢	Lamson & Sessions' Engineers'.....	60¢/10¢
<b>Skins, Thimble—</b>		Boynton's Moon Day.....	15¢/10¢	<b>Triers—</b>		Lamson & Sessions' Standard.....	70¢/10¢
Western list.....	75¢/50¢/75¢/10¢	Parlor Fringe Stone Enamel.....	50¢/10¢/5	Butter and cheese.....	25¢	Goes' Pattern, Wrought.....	75¢/10¢/5
Columbus Wire Steel, list Nov. 1, 1887.....	20¢	Yates' Liquid.....	10¢/10¢/10¢	<b>Trucks, Warehouse, &amp;c.—</b>		Girard Agricultural.....	75¢/10¢/5
Coldbrookdale Iron Co.....	50¢/10¢	Yates Standard Paste Polish, 10-m cans.....	12¢/6	B. & L. Block Co.'s list, '82.....	40¢	Lamson & Sessions' Agric'l.....	75¢/10¢/5
Utica P. S. T. Skins.....	60¢	Jet Black.....	15¢	<b>Tubes, Boiler—</b>		Sterling Wrought.....	
Utica Turned and Fitted.....	35¢	Japanese.....	35¢	See Pipe.....		Bemis & Call's	
<b>Sieves—</b>		Fireside.....	25¢	<b>Twine—</b>		Pat. Combination.....	35¢
Buffalo Metallic, S. S. & Co.....	50¢/25¢/10¢	Diamond O. K. Enamel.....	10¢/10¢	Flax Twine.....	BC. B.	Merrick's Pattern.....	35¢
Shaker (Barber's Pat.) Flour Sifters.....	50¢/10¢	Bonnell's Liquid Stove Polish.....	50¢/10¢	No. 9, 1/4 and 1/2 B. Balls.....	22¢ 30¢	Brigg's Pattern.....	25¢
Electric.....	50¢/10¢	Bonnell's Paste Stove Polish.....	50¢/10¢	No. 12, 1/4 and 1/2 B. Balls.....	21¢ 29¢	Cylinder or Gas Pipe.....	40¢/5
Hunter's.....	50¢/10¢	Black Eagle Benzine Paste, 5 and 10 m cans.....	12¢/6	No. 16, 1/4 and 1/2 B. Balls.....	18¢ 28¢	No. 3 Pipe.....	40¢/10¢
Smith's Adjustable Sifters.....	50¢/10¢	Nickel Plate Paste.....	50¢/10¢	No. 24, 1/4 and 1/2 B. Balls.....	18¢ 28¢	Allen's Pocket (Bright).....	80¢/10¢
Smith's Adjustable Milk Strainer.....	50¢/10¢	<b>Tacks, Brads, &amp;c.—</b>		No. 36, 1/4 and 1/2 B. Balls.....	16¢ 27¢	The Favorite Pocket.....	50¢/10¢
Smith's Adjustable T. & C. Strainer.....	50¢/10¢	List Jan. 2, 1888.....		No. 204, Mattress, 1/4 and 1/2 B. Balls.....	18¢ 28¢	Webster's Pat. Combination.....	25¢
<b>Sieves, Wooden Rim—</b>		Some manufacturers are selling Tacks at slightly higher prices than those named:		Chalk Line, Cotton, 1/4 B. Balls.....	18¢ 28¢	Boardman's.....	20¢/10¢
Mesh 18, Nested, 5 doz.....	70¢	American Iron Carpet.....	80¢/80¢/5	Mason Line, Linen, 1/4 B. Balls.....	18¢ 28¢	Always Ready.....	25¢/5
Mesh 20, Nested, 5 doz.....	80¢	Swedes Iron Carpet.....	80¢/80¢/5	2-Ply Hemp, 1/4 and 1/2 B. Balls (Spring Twine).....	11¢/6	Alligator.....	50¢
Mesh 24, Nested, 5 doz.....	1.10	American Iron Cut.....	75¢/75¢/10¢	3-Ply Hemp, 1/4 B. Balls.....	12¢/6	Donohue's Engineer.....	20¢/10¢
<b>Slates—</b>		Swedes Iron.....	75¢/75¢/10¢	Cotton Wrapping, 5 Balls to m.....	15¢/16¢	Acme, Bright.....	60¢/10¢
School, by case.....	40¢	Swedes Iron, Upholsterers'.....	75¢/10¢/80¢	2, 3, 4 and 5-Ply Jute, 1/4 B. Balls.....	10¢	Acme, Nickle.....	50¢/35¢
<b>Snaps, Harness, &amp;c.—</b>		<b>Tinned Swedes Iron.....</b>	<b>75¢/10¢/80¢</b>	Wool.....	6¢/6¢/6	Walker's.....	55¢/35¢
Anchor (T. & S. Mfg. Co.).....	65¢	Gimp and Lace.....	75¢/10¢/80¢	Cotton Mops, 6, 9, 12 and 15 lb to doz.....	18¢	Diamond Steel.....	55¢/35¢
Fitch's (Bristol).....	50¢/10¢	Tinned Gimp and Lace.....	75¢/10¢/80¢	<b>Wringers, Clothes—</b>		List March 11, 1889, 25 cash.	
Hotchkiss.....	10¢	Swedes Iron Trimmers.....	75¢/10¢/75¢/10¢/5	<b>Wrought Goods—</b>		<b>Wrought Goods—</b>	
Andrews.....	50¢	Swedes Iron Miners'.....	75¢/10¢/75¢/10¢/5	Staples, Hooks, &c., list Jan. 12, 1886.....			
Sargent's Patent Guarded.....	70¢/10¢/10¢	Swedes Iron Bill Posters' or Railroad.....	75¢/10¢/75¢/10¢/5				
German, new list.....	40¢/10¢						
Covert, New Patent.....	50¢/50¢/25¢						
Covert, New R. E.....	60¢/25¢						
Covered Springs.....	60¢/10¢/10¢						
<b>Soldering Irons—</b>							
Covert's Adjustable, list Jan. 1, 1886.....	35¢/25¢						

# CURRENT METAL PRICES.

JULY 24, 1889.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

## IRON AND STEEL.

### Bar Iron from Store.

Common Iron:	
1 to 2 in. round and square.	1 lb 1.00 @ . . .
1 to 6 in. x 1/2 to 1 in.	1 lb 2.00 @ 2.10¢
Refined Iron:	
1 to 2 in. round and square.	1 lb 2.20 @ 2.30¢
1 to 4 in. x 1/2 to 1 in.	1 lb 2.10 @ 2.20¢
4 1/2 to 6 in. x 1/2 to 1 in.	1 lb 2.20 @ 2.30¢
1 to 6 in. x 1/2 and 5-16	1 lb 2.20 @ 2.30¢
Rods—1/2 and 11-16 round and sq.	1 lb 2.20 @ 2.30¢
Bands—1 to 6 x 3-16 to No. 12	1 lb 2.20 @ 2.30¢
"Burden Best" Iron, base price.	1 lb 3.00 @ . . .
Burden's "H. B. & S." Iron, base price.	1 lb 2.80 @ . . .
"Uster"	1 lb 3.00 @ . . .
Norway Rods	4.00 @ 5.00¢

### Merchant Steel from Store.

Open-Hearth and Bessemer Machinery,	
Toe Calk, Tire and Sleigh Shoe, base price in small lots.	2 1/2¢
Best Cast Steel, base price in small lots	5¢
Best Cast Steel Machinery, base price in small lots.	5¢

### Sheet Iron from Store.

Common American.	R. G. Cleaned.
10 to 16.	1 lb 2.75 @ 2.80¢
17 to 20.	1 lb 2.85 @ 3.00¢
21 to 24.	1 lb 3.00 @ 3.10¢
25 and 26.	1 lb 3.20 @ 3.30¢
27.	1 lb 3.35 @ 3.37 1/2¢
28.	1 lb 3.50 @ 4.00¢
Galv'd, 14 to 20.	1 lb 4.50 @ 4.38¢
Galv'd, 21 to 24.	1 lb 4.85 1/2 @ 4.75¢
Galv'd, 25 to 26.	1 lb 5.25 @ 5.12¢
Galv'd, 27.	1 lb 5.62 1/2 @ 5.48¢
Galv'd, 28.	1 lb 6.00 @ 5.85¢
Patent Planished.	1 lb A 10¢
Russia.	1 lb 9 1/2¢ @ 10¢
American Cold Rolled B. R.	1 lb 5¢ @ 7¢
Craig Polished Sheet Steel.	1 lb 8¢

### English Steel from Store.

Best Cast	1 lb 15¢
Extra Cast	1 lb 16 1/2¢
Swaged Cast.	1 lb 16¢
Best Double Shear.	1 lb 15¢
Blister, 1st quality.	1 lb 12¢
German Steel, Best.	1 lb 10¢
2d quality.	1 lb 9¢
3d quality.	1 lb 8¢
Sheet Cast Steel, 1st quality.	1 lb 15¢
2d quality.	1 lb 14¢
3d quality.	1 lb 12 1/2¢

## METALS.

### Tin.

Banca, Pigs.	Per lb 22¢
Straits, Pigs.	21 1/2¢
English, Pigs.	22¢
Straits in Bars.	23¢

### Tin Plates.

Charcoal Plates.—Bright.	
Melyn Grade.	
IC, 10 x 14.	\$5.75 @ \$6.00
IC, 12 x 12.	6.00 @ 6.25
IC, 14 x 20.	5.75 @ 6.00
IC, 20 x 28.	12.00 @ 12.50
IX, 10 x 14.	7.25 @ 7.50
IX, 12 x 12.	7.50 @ 7.75
IX, 14 x 20.	7.25 @ 7.50
IX, 20 x 28.	15.00 @ 15.50
DC, 12 1/2 x 17.	5.50 @ 5.75
DX, 12 1/2 x 17.	7.00 @ 7.25
Call and Grade.	
IC, 10 x 14.	5.75 @ 6.00
IC, 12 x 12.	6.00 @ 6.25
IC, 14 x 20.	5.75 @ 6.00
IX, 10 x 14.	7.25 @ 7.50
IX, 12 x 12.	7.50 @ 7.75
IX, 14 x 20.	7.25 @ 7.50
IX, 20 x 28.	15.00 @ 15.50
DC, 12 1/2 x 17.	4.75 @ 5.00
DX, 12 1/2 x 17.	5.75 @ 6.00
Coke Plates.—Bright.	
Steel Coke.—IC, 10 x 14, 14 x 20.	\$4.75 @ \$5.00
10 x 20.	7.25 @ 7.50
20 x 28.	9.75 @ 10.25
IX, 10 x 14, 14 x 20.	5.50 @ 5.75
BV Grade.—IC, 10 x 14, 14 x 20.	4.40 @ 4.60
Charcoal Plates.—Terne.	
Dean Grade.—IC, 14 x 20.	\$4.35 @ \$4.62 1/2
20 x 28.	8.75 @ 9.25
IX, 14 x 20.	5.40 @ 5.62 1/2
20 x 28.	11.00 @ 11.37 1/2
Abecarne Grade.—IC, 14 x 20.	4.25 @ 4.50
20 x 28.	8.45 @ 9.00
IX, 14 x 20.	5.25 @ 5.50
20 x 28.	10.50 @ 10.80

### Tin Boiler Plates.

IXX, 14 x 26.	112 sheets @ \$12.50 @ \$12.75
IXX, 14 x 28.	112 sheets @ 12.75 @ 12.90
IXX, 14 x 31.	112 sheets @ 14.25 @ 14.40
Copper.	
Duty: Pig. Bar and Ingots, 4¢; Old Copper, 3¢	
1 lb. Manufactured (including all articles of which Copper is a component of chief value), 45¢ ad valorem.	
Ingot.	
"Lake"	@ 13 1/4¢
"Anchor" Brand.	@ 12 1/2¢

## Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, May 23, 1889, being quotations for all sized lots.

			Weights per square foot and prices per pound.							
Not wider than	Not longer than	And longer than	Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 10 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		30	30	20	21	22	23	25	28
30		72	30	30	20	21	23	24	26	29
36	96		20	20	20	22	24	25	27	30
36		96	20	20	21	23	25	26	28	31
48	96		20	20	22	24	26	27	29	32
48		96	20	20	23	25	27	28	30	33
60	96		20	20	25	27	31	32	34	37
60		96	20	20	26	28	32	33	35	38
84	96		21	22	23	24	25	26	27	28
84		96	22	23	24	25	26	27	28	29
Over 84 in. wide			23	25	26	27	28	29	30	31

All Bath Tub Sheets. 16 oz. 14 oz. 12 oz. 10 oz. Per pound. . . . . 20.50 0.25 0.27 0.30

Bolt Copper, 1/2 inch diameter and over, per pound. . . . . 30¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 60 inches diameter, up to 96 inches diameter, inclusive, 5 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Circles, over 96 inches diameter, 6 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Segment and Pattern Sheets, 3 cents per pound advance over price of sheets required to cut them from.

Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, 1 cent per pound over the foregoing prices.

Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, 2 cents per pound over the foregoing prices.

### Copper Bottoms, Pits and Flats.

14 ounce to square foot and heavier. . . . . 23¢

12 ounce and up to 14 ounce to square foot. . . . . 24¢

10 ounce and up to 12 ounce. . . . . 25¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

### Tinning.

Tinning sheets on one side, 10, 12 and 14 x 48 each. . . . . 8¢

Tinning sheets on one side, 30 x 60 each. . . . . 30¢

For tinning boiler sizes, 9 in (sheets 14 in. x 60 in.), each. . . . . 15¢

For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each. . . . . 12¢

For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each. . . . . 12¢

Tinning sheets on one side, other sizes, per square foot. . . . . 2 1/2¢

For tinning both sides double the above prices.

### Planished Brass and Copper.

14 and 16 oz. and heavier. . . . . 31¢. By the case. . . . . 30¢

12 oz. and lighter. . . . . 33¢. By the case. . . . . 32¢

24 x 48 and 30 x 60. . . . . 34¢

14 and 16 oz. and heavier. . . . . 44¢. 12 oz. . . . . 37¢

### Seamless Brass and Copper Tubes.

O. G.	N. G.	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8	8 1/2	9	9 1/2	10	10 1/2	11	11 1/2	12	12 1/2	13	13 1/2	14	14 1/2	15	15 1/2	16	16 1/2	17	17 1/2	18	18 1/2	19	19 1/2	20	20 1/2	21	21 1/2	22	22 1/2	23	23 1/2	24	24 1/2	25	25 1/2	26	26 1/2	27	27 1/2	28	28 1/2	29	29 1/2	30	30 1/2	31	31 1/2	32	32 1/2	33	33 1/2	34	34 1/2	35	35 1/2	36	36 1/2	37	37 1/2	38	38 1/2	39	39 1/2	40	40 1/2	41	41 1/2	42	42 1/2	43	43 1/2	44	44 1/2	45	45 1/2	46	46 1/2	47	47 1/2	48	48 1/2	49	49 1/2	50	50 1/2	51	51 1/2	52	52 1/2	53	53 1/2	54	54 1/2	55	55 1/2	56	56 1/2	57	57 1/2	58	58 1/2	59	59 1/2	60	60 1/2	61	61 1/2	62	62 1/2	63	63 1/2	64	64 1/2	65	65 1/2	66	66 1/2	67	67 1/2	68	68 1/2	69	69 1/2	70	70 1/2	71	71 1/2	72	72 1/2	73	73 1/2	74	74 1/2	75	75 1/2	76	76 1/2	77	77 1/2	78	78 1/2	79	79 1/2	80	80 1/2	81	81 1/2	82	82 1/2	83	83 1/2	84	84 1/2	85	85 1/2	86	86 1/2	87	87 1/2	88	88 1/2	89	89 1/2	90	90 1/2	91	91 1/2	92	92 1/2	93	93 1/2	94	94 1/2	95	95 1/2	96	96 1/2	97	97 1/2	98	98 1/2	99	99 1/2	100	100 1/2	101	101 1/2	102	102 1/2	103	103 1/2	104	104 1/2	105	105 1/2	106	106 1/2	107	107 1/2	108	108 1/2	109	109 1/2	110	110 1/2	111	111 1/2	112	112 1/2	113	113 1/2	114	114 1/2	115	115 1/2	116	116 1/2	117	117 1/2	118	118 1/2	119	119 1/2	120	120 1/2	121	121 1/2	122	122 1/2	123	123 1/2	124	124 1/2	125	125 1/2	126	126 1/2	127	127 1/2	128	128 1/2	129	129 1/2	130	130 1/2	131	131 1/2	132	132 1/2	133	133 1/2	134	134 1/2	135	135 1/2	136	136 1/2	137	137 1/2	138	138 1/2	139	139 1/2	140	140 1/2	141	141 1/2	142	142 1/2	143	143 1/2	144	144 1/2	145	145 1/2	146	146 1/2	147	147 1/2	148	148 1/2	149	149 1/2	150	150 1/2	151	151 1/2	152	152 1/2	153	153 1/2	154	154 1/2	155	155 1/2	156	156 1/2	157	157 1/2	158	158 1/2	159	159 1/2	160	160 1/2	161	161 1/2	162	162 1/2	163	163 1/2	164	164 1/2	165	165 1/2	166	166 1/2	167	167 1/2	168	168 1/2	169	169 1/2	170	170 1/2	171	171 1/2	172	172 1/2	173	173 1/2	174	174 1/2	175	175 1/2	176	176 1/2	177	177 1/2	178	178 1/2	179	179 1/2	180	180 1/2	181	181 1/2	182	182 1/2	183	183 1/2	184	184 1/2	185	185 1/2	186	186 1/2	187	187 1/2	188	188 1/2	189	189 1/2	190	190 1/2	191	191 1/2	192	192 1/2	193	193 1/2	194	194 1/2	195	195 1/2	196	196 1/2	197	197 1/2	198	198 1/2	199	199 1/2	200	200 1/2	201	201 1/2	202	202 1/2	203	203 1/2	204	204 1/2	205	205 1/2	206	206 1/2	207	207 1/2	208	208 1/2	209	209 1/2	210	210 1/2	211	211 1/2	212	212 1/2	213	213 1/2	214	214 1/2	215	215 1/2	216	216 1/2	217	217 1/2	218	218 1/2	219	219 1/2	220	220 1/2	221	221 1/2	222	222 1/2	223	223 1/2	224	224 1/2	225	225 1/2	226	226 1/2	227	227 1/2	228	228 1/2	229	229 1/2	230	230 1/2	231	231 1/2	232	232 1/2	233	233 1/2	234	234 1/2	235	235 1/2	236	236 1/2	237	237 1/2	238	238 1/2	239	239 1/2	240	240 1/2	241	241 1/2	242	242 1/2	243	243 1/2	244	244 1/2	245	245 1/2	246	246 1/2	247	247 1/2	248	248 1/2	249	249 1/2	250	250 1/2	251	251 1/2	252	252 1/2	253	253 1/2	254	254 1/2	255	255 1/2	256	256 1/2	257	257 1/2	258	258 1/2	259	259 1/2	260	260 1/2	261	261 1/2	262	262 1/2	263	263 1/2	264	264 1/2	265	265 1/2	266	266 1/2	267	267 1/2	268	268 1/2	269	269 1/2	270	270 1/2	271	271 1/2	272	272 1/2	273	273 1/2	274	274 1/2	275	275 1/2	276	276 1/2	277	277 1/2	278	278 1/2	279	279 1/2	280	280 1/2	281	281 1/2	282	282 1/2	283	283 1/2	284	284 1/2	285	285 1/2	286	286 1/2	287	287 1/2	288	288 1/2	289</
-------	-------	-----	-----	---	-------	-------	-------	---	-------	---	-------	---	-------	---	-------	---	-------	---	-------	---	-------	---	-------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	----	--------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-----	---------	-------